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SOIL CONSERVATION

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

J. Phil Campbell in a convincing article, "An Agricultural Movement Marches On," statistically summarizes organization progress of Soil Conservation Districts . . . Lloyd Partain notes Oklahoma Defense Board recommendations for seasonal practices . . . Other pertinent reports come from Michigan, Arkansas, and the far West.

UNITED STATES DEPARTMENT OF AGRICULTURE – WASHINGTON

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WELLINGTON BRINK
EDITOR

Soil Conservation is issued monthly by Soil Conservation Service of the United States Department of Agriculture, Washington, D. C. The matter contained herein is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with the approval of the Director of the Budget. Soil Conservation seeks to supply to workers of the Department of Agriculture engaged in soil conservation activities, information of special help to them in the performance of their duties. Copies may also be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., 10 cents a copy, or by subscription at the rate of $1.00 per year, domestic; $1.50 per year, foreign. Postage stamps will not be accepted in payment.

SOIL CONSERVATION

CLAUDE R. WICKARD
Secretary of Agriculture

HUGH H. BENNETT
Chief, Soil Conservation Service

VOL. VII • NO. 8 ISSUED MONTHLY BY THE SOIL CONSERVATION SERVICE, DEPARTMENT OF AGRICULTURE, WASHINGTON FEB. • 1942

FOOD FOR FREEDOM WITH SOIL CONSERVATION

By LLOYD E. PARTAIN [1]

PATRIOTISM of the farm people builds higher and stronger their desires to contribute in the fullest measure within their power to the defense of democracy and all its ideals. These people are eagerly asking their neighbors, their leaders, and public servants in the agricultural profession, "What more can we do?"

The Government has told farmers generally what agricultural commodities are needed "to win the war and write the peace." Plans are developed with each individual farmer in order that he and his farm can make the maximum contribution. Fortunately, farmers can meet production needs and at the same time conserve soil and soil resources. To do this most farmers feel that they must have all the technical counsel they can get, together with good leadership and sound organization. Their purpose is to produce without waste—to conserve.

A current example of how Federal, State, and local agricultural workers are working with farmers through locally organized leadership is to be found in Oklahoma. Here the State Soil Conservation Advisory Committee has suggested to the Oklahoma USDA Defense Board a number of seasonal soil and water conservation practices which can be installed by farmers without technical assistance. The State Defense Board approved this list and sent copies to all county USDA Defense Boards in the State.

The practices reflect the thinking of representatives of the State Extension Service, the State Agricultural Experiment Station, and the Soil Conservation Service in the State. In transmitting these recommended practices, the State USDA Defense Board stated:

"Every farmer should prepare a complete long-time plan for maximum soil conservation on his farm where the necessary surveys and technical assistance are available. Where such assistance is not *immediately* available, we suggest farmers *select from the following practices those which are adaptable to his farm needs.* The establishment of such measures and practices should contribute to the Food for Freedom Program, as well as to a long-time plan of soil and moisture conservation."

County defense boards may select and recommend from the list those practices applicable to individual counties. Each farmer may then select such practices for establishment on his farm as are "in accordance with the desires of the farmer, equipment available, and the needs of the land" and which will aid in reaching his own "Food for Freedom" goals. The farmer can check the provisions of his 1942 AAA handbook and determine the soil building allowance benefits which are possible as a result of establishing these simple practices. He will find that most of those recommended are included in the handbook.

Farmers are urged to call on neighborhood, community, and county leaders and local representatives of agricultural agencies for assistance and guidance. County extension agents, SCS workers, FSA supervisors, vocational agriculture teachers, county and community AAA committeemen, and representatives of other agencies are listed as those being in a position to assist farmers in effecuating this work.

Local leadership in soil conservation is well developed in Oklahoma through the mechanism of soil conservation districts. More than 50 of these districts, covering more than 65 percent of the area of the State, are organized in Oklahoma. In each of these

[1] Extension–SCS soil conservationist, division of States relations, Soil Conservation Service, Washington, D. C.

districts, 5 supervisors and, in most districts, many more neighborhood or community leaders are taking the lead in getting work done on the land. Farmers in districts are a part of a going concern through which they can obtain information, get help as available, and democratically approach their problems. These districts, no doubt, furnish a clear channel through which county defense boards and the representatives of other agencies can effectively reach groups of farmers with leadership that is ready to take hold and push the program.

Following is the list of recommended seasonal practices released to county USDA Defense Boards in Oklahoma. As the spring season comes on, the spring practices might well be reemphasized, by local newspapers and through other media.

SEASONAL SOIL AND WATER CONSERVATION PRACTICES WHICH CAN BE INSTALLED BY FARMERS WITHOUT TECHNICAL ASSISTANCE

Winter

Planning a home garden for family food supply.
Utilizing all manure produced on the farm.
Protecting crop residues from fire and grazing.
Make necessary farm machinery and equipment repairs.
Sampling of soil and testing to determine acidity or alkalinity and phosphorus content.
Removing undesirable shrub and certain weed species as cacti from pasture land.
Protecting springs and stock water with fences.
Fencing woodland for protection against grazing.
Refraining from burning brush heaps in woodland.
Practicing fire prevention and suppression for pasture, woodland, and wildlife areas.
Planting trees for windbreaks in areas where the practice has been successful.
Selecting tree and other vegetative species which produce food and cover for wildlife when planting windbreaks, hedges, field borders, gullies, etc.
Fencing field and pasture boundaries to control the movement of livestock.
Leveling hummocks and fence drifts formed by wind action.
Fencing desilting plots above stock water.
Practicing rodent control.

Spring

Providing a home garden for family food supply.
Improving old pastures with lime, fertilizer, disking and seeding.
Using supplemental pastures in connection with native pastures and feed supplies.
Establishing seed plots so as to have a supply of good home-grown seed.
Providing proper maintenance of terraces and drainage systems.
Seeding, maintaining and managing grass waterways in draws for hay and pasture.
Sowing grasses and legumes in grain for increasing cover and late summer hay.
Growing green manure crops for cover and fertility.
Using interplanted crops for season cover.
Improving the cropping system by the inclusion of grains, grasses, and legumes.
Using rotations which permit established grass or legumes to remain for two or more years.
Using rotations which include soil improving crops.
Practicing plant disease control.
Establishing strips for wind erosion (where practice has been successfully used; if a new practice in locality, should have technical assistance).
Practicing contour tillage.
Practicing shallow tillage to kill weeds and preserve moisture.
Practicing rodent control.

Summer

Mowing pastures to suppress weeds and encourage growth of desirable grasses.
Building up and maintaining feed reserves to protect native grass pastures.
Using supplemental pastures in connection with native pastures and feed supplies.
Providing habitats which supply food and cover for wildlife.
Practicing rodent control.
Practicing insect control.
Cultivating young tree plantings for weed control and conservation of moisture.
Using rough cloddy tillage in wind erosion areas.
Using lister, chisel, killifer, basin lister, or pit cultivator in low rainfall and wind erosion areas.
Incorporating organic matter in soils.

Fall

Provide a fall garden for family food supply.
Growing winter grains after clean-tilled crops.
Permitting a heavy crop residue to remain for cover.
Protecting crop residues from fire and grazing.
Using rotations which permit established grass or legumes to remain for 2 or more years.
Using rotations which include soil-building crops (example: vetch, peas, etc.).
Using the necessary fertilizers to condition the soil for crops to be grown.
Using supplemental pastures in connection with native pastures and feed supplies.
Building up and maintaining feed reserves to protect native grass pastures.
Providing proper maintenance of terraces and drainage systems.
Providing habitats which supply food and cover for wildlife.
Leaving shocks of corn, grain, canes, etc., near field borders for winter feed for wildlife.
Practicing fire prevention and suppression for pasture, woodland, and wildlife areas.
Controlling hunting privileges.

(Signed) H. P. MOFFITT,
State USDA Defense Board.

COMING NEXT MONTH

"Selective Service for Each Acre," by Glennon Loyd;
"Farm Conservation Planning for War Needs," by E. H. Reed

DISTRICT AND SCHOOLS COOPERATE IN HANDLING EQUIPMENT

By FRED C. BURNS [1]

SUPERVISORS of the Fourche LaFave-Petit Jean Soil Conservation District in Yell County, Ark., and the vocational agricultural departments of seven consolidated high schools in the district have devised a plan for the most efficient use and proper maintenance of equipment granted to the district for erosion control work on farms cooperating in the soil conservation district program. Agreements signed by the supervisors and vocational agriculture instructors are proving profitable to both farmers and the agricultural departments.

Under the terms of this agreement, developed after careful study of several different methods, the supervisors of the district allocate certain pieces of equipment to the vocational agriculture instructors. The equipment is then to be rented to the land owners and cooperators in the respective school districts for developing erosion control measures on the farm lands in that community. Twenty-five percent of the money received from the farmers for the privilege of using the equipment is retained by the local Future Farmers of America chapter as compensation for their time and trouble in supervising the equipment. The remaining 75 percent collected is used for maintenance of the present equipment and for purchase of additional equipment.

The number of pieces and type of equipment, as well as the charges made for its use, was determined at a joint meeting of the board of supervisors, the county agricultural extension agent and the vocational agriculture instructors in the district. In determining the number of pieces of equipment allocated to any given vocational center, consideration was given to the number of soil conservation district agreements in the community, the needs and capabilities of the farmers in the community, and the efficiency with which the equipment could be used in the community.

In this plan the fees charged for the privilege of using the equipment are payable in advance and have been set high enough to assure proper maintenance and normal replacements. On the other hand, the payments are low enough that the farmers of the district can use the equipment economically. The charges vary, depending on the original cost, less normal depreciation, and the anticipated costs of upkeep. For example, should Jim Smith need a Kelly plow for constructing contour ridges or furrows on his farm he would be required to deposit 50 cents with the FFA chapter before taking the plow to his farm. This initial deposit would entitle Smith to the use of the plow for 5 full days. Should he keep the plow for 7 days he would be assessed an additional 20 cents when he returned the plow to the storage shop. If, however, Mr. Smith should complete his job before 5 days had passed and return the plow, he would be entitled to a refund of 10 cents per day for each day under the original 5 days for which he had paid. Instead, if Mr. Smith desired, he could be given credit in a like amount for further use of the plow in the future.

Again, if Mr. Smith wants to construct terraces on his farm, by depositing $1 with the FFA chapter he may rent a terracer for 2 days with the privilege of using it as long as he needs it, provided he pays an additional 50 cents for each day he keeps the terracer over the original 2 days.

Other equipment available for erosion-control work on farms cooperating in the district program includes fresnos. A deposit of 75 cents is necessary and this entitles the farmer to the use of the fresno for 5 days. He agrees to pay an additional 15 cents for each day afterwards that the fresno is kept on the farm. Hillside plows may be obtained for an initial deposit of 50 cents, and the farmer may keep the plow 5 days before any additional charges are made. Lespedeza combines require a deposit of $1, and $1 additional for each succeeding day that the combine is kept on the farm.

Before development of this plan for maintenance and supervision of the equipment granted to them, the supervisors of the Fourche LaFave-Petit Jean Soil Conservation District had tried several different methods with varying degrees of success. None had proved satisfactory, however, and as a result the equipment was in a bad state of repair and the outlook for new equipment was none too good. But with this latest plan the equipment is kept in an excellent state of repair and a reserve is being built up for purchase of new equipment. Too, a more efficient use is being made of the available equipment—when the farmer makes arrangements for renting a piece

[1] Assistant agronomist, Western Gulf Region, Soil Conservation Service, Danville, Ark.

of equipment, he has already made plans to use it immediately so that it may be returned as quickly as possible.

Today there is no idle equipment on the farms in the Fourche LaFave-Petit Jean Soil Conservation District.

The agreement as worked out by the supervisors of the Fourche LaFave-Petit Jean Soil Conservation District is presented below in its entirety:

Agreement between
FOURCHE LAFAVE-PETIT JEAN SOIL CONSERVATION DISTRICT
and
VOCATIONAL AGRICULTURAL DEPARTMENT, DARDANELLE SCHOOL DISTRICT

Recognizing the close relationship between the programs of the Fourche LaFave-Petit Jean Soil Conservation District and Vocational Agriculture, and for the purpose of coordinating the efforts of the District and the Vocational Agriculture Instructors in controlling erosion on cooperating farms within *the Fourche LaFave-Petit Jean Soil Conservation District*, it is agreed that the Vocational Agriculture Department of *Dardanelle School District No. 15*, will furnish storage, and maintain and repair equipment and tools included in the attached list, said list to become a part of this agreement.

It is further agreed that the vocational instructor charge a fee for the use of said equipment, the fees to be in accordance with the attached price schedule.

It is further agreed that the vocational instructor will retain twenty-five (25) percent of all fees collected (to revert to the treasury of the local Future Farmers of America Chapter) as compensation for his time and trouble in supervising the above equipment, and that he will use what is necessary of the remaining seventy-five (75) percent to assure proper maintenance of said equipment. All remaining monies shall revert to the Board of Supervisors of the Fourche LaFave-Petit Jean Soil Conservation District, who will be entitled to a report on the condition of the equipment and a financial statement semiannually.

This agreement may be terminated by mutual consent of the parties involved or by written notice by either partner, such notice to be given at least thirty (30) days before the date of effect.

VOCATIONAL AGRICULTURE DEPARTMENT
SCHOOL DISTRICT NO. 15,
By (S) HAROLD SNYDER,
Vocational Agriculture Instructor.
FOURCHE LAFAVE-PETIT JEAN
SOIL CONSERVATION DISTRICT,
By (S) DONALD BARGER,
Chairman, Board of Supervisors.

POOLING EFFORTS FOR SOIL CONSERVATION WORK

FARMERS and others are beginning to use their soil conservation districts to meet local erosion control problems effectively. The soil conservation job is enormous. Many different resources and many varied interests are at work. As an indication of an ever-increasing pooling of efforts, we here present a summary recently made by the Michigan State Soil Conservation Committee [1] of information supplied by each soil conservation district in that State of the sources and kinds of help being used by districts to carry on their work. The information was requested by the State Committee essentially so it would be in better position to help the districts most effectively. The summary, however, also indicates the possibilities through pooling of efforts necessary for localities and the Nation as a whole to meet the soil conservation problems.

Allegan Soil Conservation District.—Organized June 17, 1940. Includes approximately 200,000 acres of Allegan and Van Buren Counties. General fruit and truck farming on light, medium, and heavy soils. Severe wind erosion. Slight to severe water erosion. Agencies assisting and types of assistance are:

Fennville Future Farmers of America. Assisted in preparing reconnaissance survey of district. Planted 5,000 evergreen seedlings. Helped set up office in Fruit Exchange Building in Fennville.

Fennville Fruit Exchange. Furnished office space free of rent.

South Haven Future Farmers of America. Planted 10,000 evergreen seedlings.

Ganges Grange. Use of building for local meetings.

Casco Township. Provided $50 for fuel and office supplies.

Soil Conservation Service. Preliminary organization and survey work.

Extension Service. Educational work in connection with organization of the district.

West Ottawa Soil Conservation District. Explained working of their district.

State Department of Conservation. Supplied trees.

Fenton Soil Conservation District.—Organized November 10, 1939. Includes approximately 115,000 acres of Livingston and Genesee Counties. Dairy and general farming area. Rolling clay and sand. Slight to severe sheet erosion. Agencies assisting and types of assistance are:

Soil Conservation Service. Soil conservation plans prepared for 56 farms. Prepared farm woodlot plans for district cooperators.

[1] Members (names and titles): L. V. Card, commissioner of agriculture (chairman); P. J. Hoffmaster, director of the Michigan Department of Conservation; E. L. Anthony, dean of agriculture, Michigan State College.

State Department of Conservation. Prepared wildlife plans for 26 farms.

Farm Security Administration. Active assistance with district cooperators.

Extension Service. Conducted educational meetings and tours on soil conservation. Cooperated with district in distribution of TVA phosphate for demonstrational purposes.

Mason Soil Conservation District.—Organized January 20, 1941. Includes approximately 125,000 acres of Mason County. General farming and fruit area. Blowing sand and slight to severe sheet erosion on clay lands. Agencies assisting and types of assistance are:

Extension Service. Assisted in organizing district and carrying on educational program in connection with district activities.

Soil Conservation Service. Preparing soil conservation plans for district cooperators.

United States Forest Service. Counseled with district on preparation of forest planting plans for schools and other public lands.

State Department of Conservation. Furnished 15,000 seedlings for reforestation work on public lands.

Townships. Secured title to lands and entered into agreement with district as to use of land.

Public Schools. School forest projects being developed.

Grange. Will assist in reforesting public lands.

Farm Bureau. Will plant trees on public lands.

North Muskegon Soil Conservation District.—Organized September 29, 1939. Includes approximately 150,000 acres of Muskegon County. Heavy clay soils. Blowing sand in general farming area. National Forest holding within District boundaries. Agencies assisting and types of assistance are:

Montague Chamber of Commerce. Furnishes office space and heat.

Montague School. Sponsored soil conservation night school, 250 attendance. Miscellaneous office work. Has school forest of 650 acres.

Montague Vocational Agriculture. Made planting boards for nursery. Lined out 10,000 trees on nursery. Will conduct woodland management meetings. Trained boys for tree planting; these trained boys are available for hire for tree planting.

Townships and Rural Schools. Have acquired approximately 3,000 acres tax-delinquent lands and are cooperating with district in preparing long-time land-use plans for these areas. 200,000 trees have been planted to date.

School Commissioner. Arranging to have conservation taught in all public schools.

Farm Security Administration. Made loans to district cooperators to carry out soil and water conservation plans. Where necessary, made grants to cooperators. Grants to be worked out on public or district leased lands. Have insisted that new clients in district have land use plans made by district.

National Youth Administration. Made available NYA boys for office work and to assist in laying out field work, surveying forests, etc.

County Welfare. Furnished labor for district nursery.

United States Forest Service. Assisted in educational program. Prepared forest management plans for school property.

State Department of Conservation. Maintains fire towers. Organized fire control crews. Supplied 175,000 seedlings for school and township forests.

Bureau of Plant Industry. Eradicate Ribes on district cooperator farms where white pine is to be planted.

Extension Service. Conducted educational and other pertinent meetings in regard to district program. Secured TVA phosphate for demonstrational work in district. Assisted in securing tax-delinquent lands. Loaned money for purchase of seedling trees.

County Governing Body. Appropriated $1,500 for fiscal year ended December 31, 1941.

Soil Conservation Service. Assisted directors in developing Program of Work. Planned 100 farms for soil conservation purposes. Supplied trees for erosion control work.

Work Projects Administration. Approved work project, no laborers yet available.

Auto Agency. Loaned tractor for nursery work. Put on demonstration on quackgrass control. Made transportation available for tour to visit Soil Conservation Service demonstration project.

St. Joe River Soil Conservation District.—Organized June 17, 1940. Includes approximately 58,000 acres of Berrien County. Intensive fruit area with slight to severe sheet erosion and occasional gullies. Very high value land. The following agencies have assisted or are willing to assist the district, according to the Secretary; no mention is made of type of assistance: County Highway Department, Co-ops, Grange, Senior Farm Bureau, Junior Farm Bureau, Vo-ag schools, Rural schools, newspapers, Extension Service, Banks,

Production Credit, AAA, Farm Loan Association, Farm Security Administration, Soil Conservation Service, Future Farmers, County Drain Commissioner, county and township governments.

Southeast Livingston Soil Conservation District.—Organized February 18, 1941. Includes approximately 69,000 acres of Livingston County. General and dairy farming. Developing program at present time.

South Muskegon Soil Conservation District.—Organized December 16, 1938. Includes approximately 140,000 acres of Muskegon County. Wind blown area of dry sands, muck lands and moraines. Soils adapted to fruit and general farming. Agencies assisting and types of assistance are:

Farm Security Administration. Loan to finance digging of 3,000 yards of marl. Loan to finance some nursery work. Loans to district cooperators. Made work grants to FSA clients when necessary, such grants to be worked out on public lands.

Forest Service. Furnished technical assistance on school forests.

State Department of Conservation. Furnishing seedlings for planting on public lands. Entered into cooperative agreement with district on use of Department-owned lands.

Work Projects Administration. Approved project for district, no laborers yet available.

County Highway Department. Loaned snow fence for use in district nursery. Cooperating on roadside erosion control work.

Public Schools. District assisted 33 schools in obtaining land for school forests. County school commissioner is developing plan for teaching conservation in schools.

Local Relief Agency. Furnished available relief labor to work in district nursery.

Sheriff's Department. Furnished jail labor for work in nursery.

County Governing Body. Appropriated $1,500 for district work.

National Youth Administration. Approved project making NYA assistance available for work on public lands.

Extension Service. Carried on educational program on soil conservation.

Soil Conservation Service. Prepared land use plans for district cooperators.

West Ottawa Soil Conservation District.—Organized May 9, 1938. Includes approximately 135,000 acres of Ottawa County. Wind eroded areas intermingled with general farming area. Stabilization of shifting sands and establishment of good land use program are major problems. Agencies assisting and types of assistance are:

County Governing Body. Appropriated $1,000 for use of district.

Sheriff's Department. Labor for use in district nursery.

Rod and Gun Club. Furnished two cultivators and one seeder for district nursery.

Fish and Game Club. Growing trees and shrubs for the district.

West Olive Ladies' Club. Donated labor for weeding of district nursery.

(*Continued on page 206*)

AN AGRICULTURAL MOVEMENT MARCHES ON

Statistical Story of the Soil Conservation District Organization

By J. PHIL CAMPBELL [1]

IN A statement dated September 21, 1940, concerning departmental cooperation with soil conservation districts the Secretary of Agriculture said, "The speed with which land owners and operators all over the United States are organizing soil conservation districts for a cooperative attack upon their problems of erosion control and soil conservation is one of the most remarkable developments in recent American agricultural history." The first soil conservation district in the United States was organized on August 4, 1937, and by December 15, 1941, slightly more than four years later, 653 districts, including about 382 million acres, had been established.

[1] Assistant Chief, Cooperative Relations and Information, Soil Conservation Service, Washington, D. C.

The Secretary also stated, "The philosophy of democratic government revolves around the principle that the mass of the people is capable of governing. It is my conviction that a democracy, therefore, cannot be said to be succeeding unless the mass of the people participates in the affairs of government. Only their participation makes a democracy work. The distinguishing characteristic of the *soil conservation* districts' legislation is that this principle is uppermost; these State *soil conservation districts* laws place the responsibility for the management of a soil conservation district upon local folk. We in the Department welcome the opportunity to work in the closest cooperation with these districts that the farmer themselves are forming and managing." [*Italics* words supplied.]

Realizing that many people are interested in the development of the soil conservation districts movement, the Secretary requested the Soil Conservation Service to issue periodically a statement summarizing the available information with reference to the number, location, and stage of organization of soil conservation districts throughout the country. Here is currently assembled information summarized for the convenience of those to whom it is not regularly available.

TABLE 1.—*Organization of soil conservation districts to Dec. 15, 1941*

Name of State	Petitions accepted	Determination made as to need		Referendum held	Determination made as to operation		Certificate of organization issued [1]	Governing body organized
		Needed	Not needed		Practical and feasible	Not practical and feasible		
Alabama	12	12	0	12	12	0	12	12
Arizona	9	9	0	.....	.....	.....	.....	.....
Arkansas	61	38	3	38	37	0	36	36
California	16	13	0	13	13	0	13	13
Colorado	33	33	0	32	22	6	22	22
Florida	16	13	2	12	11	0	10	10
Georgia	28	21	0	21	19	1	19	19
Idaho	17	12	0	12	10	2	9	9
Illinois	16	14	0	13	12	1	10	9
Indiana	23	17	5	17	12	5	12	12
Iowa	23	19	0	18	17	1	17	17
Kansas	65	44	9	43	16	26	16	16
Kentucky	23	21	1	19	17	2	16	14
Louisiana	36	13	0	13	13	0	13	13
Maine	3	3	0	.....	.....	.....	.....	.....
Maryland	12	11	0	11	11	0	8	8
Michigan	10	10	0	10	9	1	9	9
Minnesota	13	13	0	12	12	0	12	12
Mississippi	42	37	4	34	34	0	33	30
Montana	11	10	0	9	8	1	8	8
Nebraska	46	40	6	40	34	6	32	31
Nevada	8	8	0	8	8	0	7	7
New Jersey	5	5	0	4	4	0	4	4
New Mexico	44	37	4	34	29	1	22	19
New York	.....	.....	.....	.....	11	0	11	10
North Carolina	19	18	0	18	14	0	13	13
North Dakota	17	15	0	15	15	0	15	15
Oklahoma	93	76	12	76	57	18	56	52
Oregon	11	9	2	7	6	0	6	6
Pennsylvania	17	10	1	10	4	1	4	4
South Carolina	13	13	0	13	13	0	12	12
South Dakota	29	26	3	24	24	0	23	23
Tennessee	19	16	1	16	16	0	16	14
Texas [2]	108	99	9	94	79	12	73	73
Utah	38	28	2	26	23	2	20	19
Vermont	4	4	0	4	4	0	4	4
Virginia	14	14	0	13	13	0	13	13
Washington	19	18	0	18	15	3	14	12
West Virginia	19	13	0	11	6	5	6	5
Wisconsin	.....	.....	.....	.....	27	0	27	27
Wyoming	7	4	0	4	4	0	.....	.....
Totals	999	816	64	774	691	94	653	632

[1] By provisions of most State soil conservation districts laws, a district is created when the certificate of organization has been recorded. See table 2 for names, approximate acreages, and generalized boundary descriptions of districts organized.
[2] Includes 8 county wind erosion conservation districts.

TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soil conservation districts established to Dec. 15, 1941*

State	Name of District	See Note for symbols	Approximate acreage	Approximate number [1]		General location
				Operating units	Farms	
			Thousands			
Alabama	Piedmont	Ma	2,070	8,319	13,878	Chambers, Clay, Coosa, Randolph, and Tallapoosa Counties.
	Central Alabama	Ma	2,548	15,115	19,257	Autauga, Dallas, Lowndes, Montgomery, and Wilcox Counties.
	Tombigbee-Warrior	Ma	3,603	15,748	24,606	Fayette, Lamar, Marion, Walker, Winston, Tuscaloosa, and Pickens Counties.
	Conecuh River	Ma	3,354	13,683	19,367	Butler, Conecuh, Monroe, Covington, Crenshaw, and Escambia Counties.
	Black Belt	Ma	2,491	10,609	20,186	Green, Hale, Marengo, Perry and Sumter Counties.
	Coosa River	Ma	2,371	9,399	16,719	Calhoun, Cherokee, Etowah, St. Clair, Cleburne, and Talladega Counties.
	Wiregrass	Ma	2,323	11,113	19,468	Coffee, Dale, Geneva, Henry, Pike, and Houston Counties.
	East Alabama	Ma	2,581	8,786	18,139	Lee, Barbour, Bullock, Elmore, Macon, and Russell Counties.
	North Central	Ma	3,007	16,480	23,454	Bibb, Blount, Chilton, Cullman, Jefferson, and Shelby Counties.
	Mobile River	Ma	3,876	10,767	13,043	Baldwin, Choctaw, Clarke, Mobile, and Washington Counties.
	Northwest Alabama	M	2,077	9,744	16,961	Colbert, Franklin, Lawrence, Lauderdale, and Morgan Counties.
	Northeast Alabama	M	2,518	15,539	26,668	DeKalb, Jackson, Limestone, Madison, and Marshall Counties.
Total	12	-----	32,819	.....	.....	
Arkansas	Mine Creek	Ma	167	890	1,299	Part of Howard and Pike Counties.
	Magazine	Ma	223	3,206	3,209	Part of Logan, Scott, and Sebastian Counties.
	G. C. C. R	Ma	307	2,630	2,854	Part of Greene and Clay Counties.
	East Central Arkansas	Ma	1,085	8,338	9,456	Part of White, Lonoke, Pulaski, Faulkner, and Cleburne Counties.
	Poteau River	Ma	423	1,587	1,670	Part of Scott and Sebastian Counties.
	Tri-River	Ma	720	5,222	5,528	Part of Lawrence and Randolph Counties.
	Lower East Saline	Ma	489	2,310	2,607	Part of Lincoln, Drew, and Ashley Counties.
	Illinois Bayou	Ma	233	1,110	1,258	Part of Pope County.
	Crooked Creek	Ma	660	2,874	3,084	Part of Marion, Boone, Searcy, and Newton Counties.
	Central Valleys	Ma	1,315	6,692	7,055	Part of Faulkner, Cleburne, Van Buren, Conway, and Pope Counties.
	South Crowley Ridge	Ma	397	3,264	4,883	Part of Lee, St. Francis and Cross Counties.
	Terre Rouge-Bodcaw	Ma	1,020	7,153	7,827	Part of Hempstead, Nevada, and Lafayette Counties.
	Central Crowley's Ridge	Ma	168	3,038	4,541	Part of Craighead and Poinsett Counties.
	Fourche LaFave-Petit Jean	Ma	628	2,380	2,480	Yell County; part of Perry County.
	King's River-Long Creek	Ma	490	2,582	2,813	Part of Boone and Carroll Counties.
	Moorefield	Ma	684	3,870	4,526	Part of Independence, Lawrence and Sharp Counties.
	L'Aigle Creek	Ma	466	1,580	1,650	Bradley County; part of Cleveland County.
	West Saline	Ma	342	1,250	1,538	Part of Cleveland County.
	Mulberry-Piney	Ma	373	2,590	2,701	Part of Franklin and Johnson Counties.
	Strawberry River	Ma	635	3,183	3,902	Izard County; part of Sharp County.
	Ouachita	Ma	469	1,850	1,952	Ouachita County.
	Cossatott	Ma	366	1,634	1,648	Sevier County.
	Washington County	Ma	611	1,250	1,348	Washington County.
	Spring River	Ma	528	2,325.	2,575	Fulton County; part of Sharp County.
	Benton County	Ma	561	4,180	5,570	Benton County.
	Madison County	M	177	850	954	Part of Madison County.
	Des Arc	.....	195	910	949	Part of Prairie County.

[1] Data are tentative and not yet available for all districts. Estimates based on 1940 census as primary source using census definition of a "farm," with the concept of "operating unit" described as follows: An "operating unit" is a tract of land (or 2 or more adjacent or nearby tracts of land), whether or not under a single ownership, operated by 1 person as a unit as to crop or grazing rotation practices, and with work stock, machinery, and labor substantially separate from that for any other land.

NOTE.—"M" Basic Memorandum of Understanding with U. S. D. A.
"a" Assistance from Soil Conservation Service through Memorandum of Understanding.
"b" Assistance from Forest Service through Memorandum of Understanding (Shelter Belt Area).
(WED) Texas County Wind Erosion Conservation Districts.
* Districts established since last report.
** Addtional territory included since last report.

TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soil conservation districts established to Dec. 15, 1941*—Continued

State	Name of District	See Note for symbols	Approximate acreage	Approximate number		General location
				Operating units	Farms	
			Thousands			
Arkansas	Little River	M	349	1,650	1,960	Little River County.
	Blue Mountain		391	1,302	1,602	Stone County.
	Dorcheat	Ma	455	3,580	3,700	Part of Columbia County.
	Lake Hamilton		472	1,305	1,573	Garland County.
	Crystal Mountain		502	1,280	1,341	Montgomery County.
	Hightower		400	1,605	1,712	Parts of Baxter and Marion Counties.
	Rich Mountain		541	1,902	1,975	Polk County.
	Little Missouri		375	1,276	1,283	Part of Pike County.
	Buffalo		440	1,809	2,071	Parts of Searcy and Baxter Counties.
Total	36		17,657			
California	San Mateo County	Ma	17	120	120	Part of San Mateo County.
	Central El Dorado	Ma	32	300	300	Part of El Dorado County.
	San Marcos-Richland-Twin Oaks.	Ma	13	101	120	Part of San Diego County.
	Gold Ridge	M	99	1,725	1,725	Part of Sonoma County.
	Moreno-Campo-Potrero	Ma	140	3	85	Part of San Diego County.
	Simi Valley	Ma	83	302	437	Part of Ventura County.
	Portal Ridge	Ma	47	500	320	Part of Los Angeles County.
	Mira Loma		6	60	60	Part of Riverside County.
	Valley Center	M	18	225	0	Part of San Diego County.
	Cucamonga-Mountain View.*		24	308	308	Part of San Bernardino County.
	Mission-Soledad*		38	98	98	Part of Monterey County.
	Scotts Valley-Upper Lake*		80	260	136	Part of Central Lake County.
	Contra Costa*		176	1,100	700	Part of Contra Costa County.
Total	13		773			
Colorado	Great Divide	Ma	376	113	113	Part of Moffat County.
	Western Baca County	Ma	853			Part of Baca County.
	Southeastern Baca County	Ma	391			Part of Baca County.
	Plainview	Ma	152			Part of Kit Carson County.
	Smoky Hill	Ma	150			Part of Kit Carson County.
	Big Sandy	Ma	155			Part of Elbert County.
	Horse and Rush Creek	Ma	239			Part of Elbert County.
	Orchard Mesa	Ma	35	325	383	Part of Mesa County.
	West Plum Creek	Ma	104			Part of Douglas County.
	Vernal Mesa	Ma	42	33	53	Part of Montrose County.
	Custer County-Divide	Ma	110			Part of Custer County.
	Upper Huerfano	Ma	487			Part of Huerfano County.
	Kannah Creek	Ma	145	37	37	Part of Mesa County.
	Glade Park	Ma	265	230	230	Part of Mesa County.
	Cheyenne	Ma	166			Part of Cheyenne County.
	Agate	Ma	275			Part of Elbert County.
	Redlands	Ma	15	190	257	Part of Mesa County.
	Shavano		21			Part of Montrose County.
	Pueblo		904			Part of Pueblo County.
	Kiowa		114			Part of Elbert and Douglas Counties.
	Stonewall		318			Part of Las Animas and Costilla Counties.
	Two Buttes*		88	115	316	Part of Baca County.
Total	22		5,406			
Florida	Holmes Creek	Ma	250	1,173	1,541	Part of Jackson and Holmes Counties.
	Perdido River	Ma	366	1,021	1,164	Escambia County.
	Choctawhatchee River	Ma	836	1,328	1,697	Walton Co.; part of Holmes County.
	Orange Hill	Ma	469	1,023	1,259	Washington County.
	Chipola River	Ma	1,100	2,750	3,358	Part of Jackson and Calhoun Counties.
	Ochlocknee River	Ma	458	1,080	1,443	Leon County.
	Jefferson	Ma	377	1,060	1,288	Jefferson County.
	Yellow River	Ma	377	429	539	Part of Okaloosa County.
	Gadsden	Ma	346	1,131	1,466	Gadsden County.
	Madison	M	460	1,252	1,499	Madison County.
Total	10		5,039			

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TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soi conservation districts established to Dec. 15, 1941*—Continued

State	Name of District	See Note for symbols	Approximate acreage	Approximate number		General location
				Operating units	Farms	
			Thousands			
Georgia	Coosa River	Ma	1,982	9,093	15,777	Bartow, Floyd, Polk, Chattooga, Gordon, Paulding, Walker, and Cobb Counties.
	Broad River	Ma	1,622	6,468	13,831	Banks, Stephens, Franklin, Madison, Hart, Wilkes, Oglethorpe, and Elbert Counties.
	Upper Chattahoochee River	Ma	1,098	4,839	8,179	Habersham, White, Lumpkin, Hall, Dawson, and Forsyth Counties.
	Middle Western Ocmulgee River.	Ma	1,887	5,845	9,526	Wilcox, Pulaski, Dooly, Peach, Houston, Crawford, Macon, Taylor, and Bibb Counties.
	Piedmont	Ma	1,660	3,914	7,534	Baldwin, Greene, Hancock, Putnam, Taliaferro, Morgan, and Jones Counties.
	Oconee River	Ma	527	2,620	5,362	Jackson, Barrow, Oconee, and Clarke Counties.
	Upper Ocmulgee River	Ma	1,246	5,917	11,320	Newton, Walton, Rockdale, Henry, Gwinnett, Clayton, and Jasper Counties; part of Dekalb County.
	West Georgia	Ma	812	4,654	8,465	Carroll, Douglas, Haralson, and Heard Counties.
	Little River	Ma	224	491	1,200	Columbia County.
	Briar Creek	Ma	1,247	2,511	5,717	Richmond, Burke, Jefferson, and Glascock Counties.
	Middle South Georgia	Ma	1,303	4,857	9,041	Ben Hill, Tift, Irwin, Crisp, Turner, and Worth Counties.
	Limestone Valley	Ma	826	3,089	5,009	Gilmer, Murray, Whitfield, and Pickens Counties.
	Ohoopee River	Ma	1,030	3,321	5,949	Treutlen, Emanuel, Montgomery, and Toombs Counties.
	Pine Mountain	Ma	1,358	3,229	5,498	Meriwether, Harris, Talbot, Chattahoochee, Muscogee, and Marion Counties.
	Lower Chattahoochee River	Ma	1,707	4,823	10,109	Schley, Terrell, Quitman, Sumter, Webster, Clay, Lee, Stewart, and Randolph Counties.
	Flint River	Ma	2,288	8,035	14,036	Baker, Seminole, Mitchell, Grady, Decatur, Early Miller, Calhoun, and Dougherty Counties.
	Central Georgia	Ma	1,151	3,378	6,198	Wilkinson, Washington, Twiggs, and Johnson Counties.
	Towaliga	Ma	705	2,221	3,934	Pike, Monroe, Spalding, and Butts Counties.
	Ogeechee River	Ma	428	1,591	2,842	Bulloch County.
Total	19		23,101			
Idaho	Latah	Ma	694	1,550	2,125	Latah County.
	Bear Lake	Ma	661	650	800	Bear Lake County.
	Mayfield	Ma	408	56	81	Part of Elmore and Ada Counties.
	Portneuf	Ma	1,170	1,800	2,200	Bannock County.
	Squaw Creek	Ma	300	200	260	Part of Gem and Boise Counties.
	Kootenai	M	829	1,600	2,011	Kootenai County.
	Oneida		776	700	935	Oneida County.
	Lewis		293	525	692	Lewis County.
	Nez Perce		525	901	1,282	Nez Perce County.
Total	9		5,656			
Illinois	Shiloh-O'Fallon	Ma	212	2,050	2,343	Part of St. Clair County.
	Munson	Ma	40	207	225	Part of Henry County.
	Whitehall-Roodhouse	Ma	80	437	515	Part of Greene County.
	R. C. L. W	Ma	80	475	645	Part of Richland, Crawford, Lawrence, and Wabash Counties.
	Pecatonica-Durand	Ma	65	403	447	Part of Winnebago and Stephenson Counties.
	Montgomery County	Ma	87	540	600	Part of Montgomery County.
	Jo Daviess County	Ma	154	937	967	Part of Jo Daviess County.
	Elmwood	Ma	158	885	950	Part of Peoria County.
	Johnson County	Ma	212	1,415	1,506	Part of Johnson County.
	Carroll County		85	474	509	Part of Carroll County.
Total	10		1,173			
Indiana	Southwestern Indiana	Ma	84	1,300	1,530	Part of Vanderburgh County.
	Knox County	Ma	323	2,625	2,847	Knox County.
	Prairie	Ma	38	189	225	Part of Benton and Warren Counties.
	Akron	Ma	31	335	362	Part of Fulton County.
	Grant County	Ma	81	878	965	Part of Grant County.
	Coal Creek	Ma	35	276	333	Part of Montgomery County.

TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soil conservation districts established to Dec. 15, 1941*—Continued

State	Name of District	See Note for symbols	Approximate acreage	Approximate number		General location
				Operating units	Farms	
			Thousands			
Indiana	Daviess County	Ma	211	2,461	2,734	Part of Daviess County.
	Tippecanoe	.....	27	123	166	Part of Tippecanoe County.
	Elkhart County	Ma	59	608	618	Part of Elkhart County.
	Noble	M	22	194	204	Part of Noble County.
	Newton	Ma	165	675	700	Part of Newton County.
	Greene-Clay-Owen	Ma	35	371	433	Part of Greene, Clay, and Owen Counties.
Total	12	.....	1,111	.....	.....	
Iowa	Marion County	Ma	35	2,302	2,513	Part of Marion County.
	Montgomery	Ma	271	1,504	1,633	Montgomery County.
	Clayton County	Ma	106	680	706	Part of Clayton County.
	Lucas County	Ma	264	1,493	1,796	Lucas County.
	Adair County	Ma	359	1,942	2,098	Adair County.
	Soldier-Maple Valley	Ma	270	1,320	1,579	Part of Monona County.
	Van Buren County	Ma	296	1,883	2,057	Van Buren County.
	Taylor County	Ma	338	2,208	2,208	Taylor County.
	Mills County	Ma	265	1,356	1,500	Mills County.
	Jefferson County	.....	263	1,662	1,782	Jefferson County.
	Crawford County	Ma	447	2,500	2,800	Crawford County.
	Linn County	M	211	1,848	1,906	Part of Linn County.
	Winneshiek County	M	427	2,598	2,887	Winneshiek County.
	Wapello County	M	258	1,884	2,008	Wapello County.
	Fremont County	Ma	311	1,670	1,742	Fremont County.
	Page County	.....	331	2,225	2,365	Page County.
	Wayne County	.....	317	1,966	2,112	Wayne County.
Total	17	.....	4,769	.....	.....	
Kansas	Labette County	Ma	412	.....	2,464	Labette County.
	Lyon County	Ma	546	.....	2,406	Lyon County.
	Osage County	Ma	460	.....	2,309	Osage County.
	Pawnee County	Mab	475	.....	1,102	Pawnee County.
	Wilson County	Ma	372	.....	1,856	Wilson County.
	Coffey County	Ma	412	.....	1,956	Coffey County.
	Brown County	Ma	365	.....	2,034	Brown County.
	Allen County	Ma	325	.....	1,949	Allen County.
	Geary County	Ma	250	.....	687	Geary County.
	Morris County	Mab	445	.....	1,414	Morris County.
	Grant County	Ma	370	.....	272	Grant County.
	Marshall County	Ma	579	.....	2,686	Marshall County.
	Ness County	M	691	.....	1,059	Ness County.
	Franklin County	Ma	374	.....	2,153	Franklin County
	Doniphan County	M	242	.....	1,670	Doniphan County.
	Trego County	.....	575	.....	884	Trego County.
Total	16	.....	6,893	.....	.....	
Kentucky	South Logan	Ma	195	1,574	1,736	Part of Logan County.
	Garrard County	Ma	148	1,479	1,922	Garrard County.
	Pendleton	Ma	177	1,556	1,741	Pendleton County.
	Union County	Ma	216	1,200	1,217	Union County.
	McCracken County	Ma	153	1,780	1,937	McCracken County.
	Marion County	Ma	218	1,566	2,122	Marion County.
	Graves County	Ma	354	4,095	4,247	Graves County.
	Carlisle County	Ma	124	1,183	1,143	Carlisle County.
	Gallatin	Ma	63	492	729	Gallatin County.
	Grant	Ma	158	1,534	1,545	Grant County.
	Tradewater	Ma	92	637	687	Part of Christian, Caldwell, and Hopkins Counties.
	Christian County	Ma	418	2,292	2,685	Part of Christian County.
	Hickman County	M	157	1,301	1,338	Hickman County.
	Richland Creek	Ma	47	567	824	Part of Knox County.
	Scott County	.....	180	929	1,617	Scott County.
	Fleming County	.....	222	1,820	2,433	Fleming County.
Total	16	.....	2,922	.....	.....	

TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soil conservation districts established to Dec. 15, 1941*—Continued

State	Name of District	See Note for symbols	Approximate acreage	Approximate number		General location
				Operating units	Farms	
			Thousands			
Louisiana	Feliciana	Ma	830	3, 509	4, 775	East Feliciana and West Feliciana Parishes; part of East Baton Rouge and St. Helena Parishes.
	Upper Sabine	Ma	935	4, 025	5, 113	Part of Caddo, De Soto, Sabine and Vernon Parishes.
	D'Arbonne	Ma	1, 179	6, 578	8, 168	Union Parish; Part of Claiborne, Lincoln, Jackson, and Ouachita Parishes.
	Upper West Red River	Ma	803	6, 589	8, 215	Part of Caddo, De Soto, Red River, Natchitoches, and Sabine Parishes.
	Saline	Ma	901	5, 321	6, 188	Part of Claiborne, Bienville, Webster, Winn, Red River, and Natchitoches Parishes.
	Dorcheat	Ma	961	5, 985	7, 097	Bossier Parish; part of Webster, Claiborne, Bienville, and Red River Parishes.
	Bogue Chitto-Pearl River	Ma	968	4, 498	6, 519	Washington Parish; part of St. Tammany, Tangipahoa, and St. Helena Parishes.
	Dugdemonia	Ma	1, 213	4, 537	5, 219	Part of Lincoln, Bienville, Caldwell, Grant, La Salle, Winn, and Jackson Parishes.
	Calcasieu	Ma	1, 500	4, 999	5, 304	Beauregard Parish; part of Allen, Vernon, and Rapides Parishes.
	Lower East Red River	Ma	1, 300	4, 200	5, 398	Grant Parish; part of Winn, La Salle, Catahoula, and Rapides Parishes.
	Grand Coteau Ridge	Ma	268	4, 391	6, 005	Part of Evangeline, St. Landry, and St. Martin Parishes.
	Lower West Red	Ma	800	2, 832	2, 952	Part of Natchitoches and Rapides Parishes.
	Northeast	.....	771	4, 564	6, 868	Morehouse County; part of West Carroll, Richland, Franklin, and Catahoula Counties.
Total	13	.....	12, 429	.....	.....	
Maryland	Kent	Ma	180	740	852	Kent County.
	Catoctin	Ma	90	792	850	Part of Frederick County.
	Gunpowder Falls—Deer Creek.	Ma	667	5, 000	5, 391	Harford and Baltimore Counties.
	Monocacy	Ma	487	4, 000	4, 163	Part of Frederick and Carroll Counties.
	Washington County	Ma	309	2, 290	2, 516	Washington County.
	Charles	Ma	297	1, 311	1, 276	Charles County.
	Prince Georges	Ma	308	1, 711	2, 158	Prince Georges County.
	Allegany	.....	265	860	900	Allegany County.
Total	8	.....	2, 603	.....	.....	
Michigan	West Ottawa	Ma	135	1, 040	1, 400	Part of Ottawa County.
	South Muskegon	Ma	140	993	1, 840	Part of Muskegon County.
	North Muskegon	Ma	150	550	1, 500	Part of Muskegon County.
	Fenton	Ma	115	1, 063	1, 047	Part of Livingston and Genesee Counties.
	St. Joe River	Ma	58	1, 023	1, 193	Part of Berrien County.
	Mason County	Ma	115	450	1, 258	Part of Mason County.
	Allegan	Ma	200	2, 600	3, 300	Part of Allegan and Van Buren Counties.
	Southeast Livingston	Ma	69	469	461	Part of Livingston County.
	Grand Traverse	Ma	298	1, 000	1, 614	Part of Grand Traverse County.
Total	9	.....	1, 280	.....	.....	
Minnesota	Burns-Homer-Pleasant	Ma	54	304	320	Part of Winona County.
	Rollingstone, Stockton, and Gilmore Creek.	Ma	92	430	450	Part of Wabasha and Winona Counties.
	Root River	Ma	406	2, 214	2, 488	Part of Houston and Winona Counties.
	East Fillmore	Ma	276	1, 820	1, 800	Part of Fillmore County.
	East Goodhue	Ma	143	825	918	Part of Goodhue County.
	Upper Zumbro	Ma	250	1, 644	1, 855	Part of Dodge and Olmsted Counties.
	Dakhue	Ma	223	1, 526	1, 628	Part of Dakota and Goodhue Counties.
	Whitewater	M	168	890	940	Part of Winona County.
	Lake Pepin	M	180	870	934	Part of Wabasha County.
	Scott County	.....	215	1, 679	1, 755	Scott County.
	East Agassiz	.....	251	884	1, 140	Part of Polk, Norman, and Clay Counties.
	Washington County	.....	223	1, 823	2, 220	Washington County.
Total	12	.....	2, 481	.....	.....	

TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soil conservation districts established to Dec. 15, 1941*—Continued

State	Name of District	See Note for symbols	Approximate acreage	Approximate number		General location
				Operating units	Farms	
			Thousands			
Mississippi	Kemper County	Ma	481	2,100	3,482	Kemper County.
	Clarke County	Ma	432	1,936	2,525	Clarke County.
	Covington County	Ma	262	1,762	2,609	Covington County.
	Lauderdale County	Ma	448	2,038	2,844	Lauderdale County.
	Claiborne County	Ma	313	672	1,800	Claiborne County.
	Franklin County	Ma	350	1,102	1,691	Franklin County.
	Madison County	Ma	464	2,173	5,538	Madison County.
	Winston County	Ma	382	2,131	3,380	Winston County.
	Leake County	Ma	369	2,566	4,205	Leake County.
	Copiah County	Ma	492	2,724	4,526	Copiah County.
	Tallahatchie River	Ma	1,000	5,257	11,575	Part of Panola, Marshall, Benton, Tippah, Union, Pontotoc, Lafayette, and Tate Counties.
	Smith County	Ma	401	2,144	3,289	Smith County.
	Lowndes County	Ma	319	1,924	3,330	Lowndes County.
	Simpson County	Ma	368	2,149	3,369	Simpson County.
	Neshoba County	Ma	359	2,645	4,384	Neshoba County.
	Holmes County	Ma	481	2,032	6,350	Holmes County.
	Jones County	Ma	445	3,009	3,951	Jones County.
	Northeast Mississippi	Ma	1,923	10,385	20,751	Lee, Itawamba, Tishomingo, Alcorn, Prentiss, Pontotoc; part of Union, Tippah, Benton, and Lafayette Counties.
	Wayne County	Ma	520	1,583	2,162	Wayne County.
	Hinds County	Ma	535	2,543	6,396	Hinds County.
	Tate County	Ma	256	1,104	3,532	Part of Tate County.
	Calhoun County	Ma	371	1,688	3,237	Calhoun County.
	Newton County	Ma	363	2,343	3,483	Newton County.
	Adams County	Ma	273	949	1,641	Adams County.
	Montgomery County	Ma	255	1,090	2,275	Montgomery County.
	Yalobusha County	Ma	314	1,321	2,928	Yalobusha County.
	Noxubee County	.....	436	.....	.....	Noxubee County.
	Webster County	.....	266	.....	.....	Webster County.
	Jasper County	.....	427	.....	.....	Jasper County.
	Marshall County	.....	277	.....	.....	Part of Marshall County.
	Three Rivers	.....	1,170	.....	.....	Greene, George, and Perry Counties.
	Rankin County*	.....	506	2,595	3,605	Rankin County.
	Warren County*	.....	366	1,266	2,310	Warren County.
Total	33	.....	15,624	.....	.....	
Montana	Wibaux	Ma	565	373	1,000	Wibaux County.
	Reserve	Ma	1,070	1,238	1,800	Sheridan County.
	Mona-Andes	Ma	340	191	500	Part of Richland County.
	Culbertson-Bainville	Ma	143	174	350	Part of Roosevelt County
	Froid	Ma	131	193	275	Do.
	Box Elder	M	700	198	600	Part of Carter County.
	Bitter Root	.....	180	60	150	Part of Missoula and Ravalli Counties.
	Green Mountain	.....	122	64	100	Part of Sanders County.
Total	8	.....	3,251	.....	.....	
Nebraska	Papio	Ma	114	811	850	Part of Washington County.
	Plum-Beaver	Mab	142	545	733	Part of Boone, Nance, and Platte Counties.
	Turkey Creek	Ma	198	1,144	1,262	Part of Pawnee, Johnson, and Gage Counties.
	Shell Creek	Mab	110	781	948	Part of Madison and Platte Counties.
	Cedar River	Mab	129	384	459	Part of Wheeler, Greeley, and Boone Counties.
	Thayer County	Ma	130	551	631	Part of Thayer County.
	Douglas	Ma	84	550	550	Part of Douglas County.
	West Richardson	Ma	71	384	441	Part of Richardson and Pawnee Counties.
	Cass	Ma	68	337	439	Part of Cass County.
	Union Creek	Mab	77	350	480	Part of Madison and Stanton Counties.
	Stanton	Mab	61	350	357	Part of Stanton County.
	Morrill County	Ma	881	1,050	1,691	Part of Morrill County.
	Wayne County	Mab	80	416	427	Part of Wayne County.
	Beaver-Sappa	Ma	180	759	812	Part of Furnas County.
	Deuel County	Ma	281	515	544	Deuel County.
	Harlan County	Ma	98	248	426	Part of Harlan County.
	Sugarloaf	Ma	225	55	64	Part of Dawes and Sioux Counties.
	Howard County	Mab	66	330	436	Part of Howard County.
	Antelope	Mab	68	293	384	Part of Antelope County.

TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soil conservation districts established to Dec. 15, 1941*—Continued

State	Name of District	See Note for symbols	Approximate acreage	Approximate number		General location
				Operating units	Farms	
			Thousands			
Nebraska	First Commissioner	Mab	154	390	756	Part of Scotts Bluff County.
	Franklin County	Mab	88	273	336	Part of Franklin County.
	Buffalo-Ravenna	Mab	134	510	625	Part of Buffalo County.
	Palisade	.....	502	600	680	Part of Hitchcock and Hayes Counties.
	Lancaster	Ma	47	217	428	Part of Lancaster County.
	Chaeo	.....	181	821	840	Part of Furnas County.
	Nemaha	.....	64	386	459	Part of Nemaha County.
	Red Willow County	Mab	455	1, 302	1, 581	Red Willow County.
	New Helena	Mab	618	1, 650	1, 700	Part of Custer County.
	Otoe	M	88	476	520	Part of Otoe County.
	Nance County	.....	175	652	1, 028	Part of Nance County.
	Pine Ridge	.....	102	81	93	Part of Dawes County.
	Thurston*	.....	155	.....	.....	Part of Thurston County.
Total	32	.....	5, 826	.....	.....	
Nevada	Moapa	Ma	461	80	104	Part of Clark County.
	Virgin Valley	Ma	207	95	114	Part of Clark County.
	Smith Valley	Ma	230	82	101	Part of Douglas and Lyon Counties
	Pahranagat Valley	Ma	1, 888	44	56	Part of Lincoln County.
	Meadow Valley	Ma	2, 638	81	105	Part of Lincoln County.
	Mason Valley	Ma	622	139	149	Part of Lyon and Mineral Counties.
	Carson Valley	Ma	377	134	179	Part of Douglas County.
Total	7	.....	6, 423	.....	.....	
New Jersey	Freehold	Ma	698	3, 630	4, 858	Mercer, Middlesex, and Monmouth Counties.
	Camburton**	Ma	1, 153	2, 450	3, 481	Burlington, Ocean, and Camden Counties.
	Morris-Warren**	Ma	542	1, 900	2, 700	Warren and Morris Counties; part of Sussex County.
	South Jersey	Ma	650	4, 000	4, 525	Gloucester and Cumberland Counties.
Total	4	.....	3, 043	.....	.....	
New Mexico	Mesa	Ma	571	.....	.....	Part of Harding, San Miguel, Colfax, and Union Counties.
	Northeastern	Ma	439	.....	.....	Part of Union County.
	De Baca County	Ma	1, 200	298	303	Part of De Baca County.
	Central Curry	Ma	897	.....	1, 191	Curry County.
	Canadian River	Ma	790	.....	.....	Part of Quay County.
	Southwest Quay	Ma	402	.....	.....	Part of Quay County.
	Otero	Ma	2, 443	797	797	Part of Otero County.
	Guadalupe	Ma	1, 622	320	320	Part of Guadalupe County.
	Roosevelt	Ma	933	.....	.....	Part of Roosevelt County.
	Border	Ma	1, 143	.....	.....	Part of Chaves and Roosevelt Counties.
	Claunch-Pinto	.....	500	208	208	Parts of Socorro, Torrance, and Lincoln Counties.
	Sedillo	.....	150	206	235	Part of Bernalillo County.
	Ute Creek	.....	750	.....	.....	Part of Harding, Union, and San Miguel Counties.
	Western Mora	.....	325	2, 000	2, 000	Part of Mora County.
	Macho	Ma	600	60	64	Part of Chaves and Lincoln Counties.
	Penasco	Ma	1, 112	.....	.....	Part of Chaves and Eddy Counties.
	Upper Hondo	M	700	.....	.....	Part of Lincoln County.
	Edgewood	.....	500	.....	.....	Part of Santa Fe County.
	Mora-San Miguel	.....	1, 275	.....	.....	Part of Mora and San Miguel Counties.
	Caballo	.....	600	.....	.....	Part of Sierra, Luna, and Dona Ana Counties.
	San Juan	.....	160	.....	.....	Part of San Juan County.
	Eastern Taos	.....	1, 000	.....	.....	Part of Taos County.
Total	22	.....	18, 112	.....	.....	
New York	Schoharie County	Ma	411	1, 520	2, 453	Schoharie County.
	Yates County	Ma	220	1, 235	1, 548	Yates County.
	Schuyler County	Ma	215	900	1, 126	Schuyler County.
	Chenango County	Ma	572	1, 980	3, 371	Chenango County.
	Wyoming County	Ma	385	1, 890	2, 616	Wyoming County.
	Madison County	Ma	416	2, 308	2, 752	Madison County.
	Oneida County	Ma	800	3, 760	4, 706	Oneida County.
	Ontario County	Ma	415	2, 200	3, 093	Ontario County.

TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soil conservation districts established to Dec. 15, 1941*—Continued

State	Name of District	See Note for symbols	Approximate acreage	Approximate number		General location
				Operating units	Farms	
			Thousands			
New York	Seneca County	Ma	215	1,180	1,413	Seneca County.
	Cattaraugus County	Ma	860	3,312	4,124	Cattaraugus County.
	Allegany County*	.....	671	1,914	3,018	Allegany County.
Total	11	.....	5,180	.....	.....	
North Carolina	Brown Creek	Ma	1,370	5,848	9,950	Anson, Montgomery, Richmond, and Union Counties.
	Fishing Creek	Ma	705	3,713	6,110	Warren and Halifax Counties.
	Tri-Creek	Ma	1,274	12,283	16,258	Yadkin, Wilkes, Surry, and Forsyth Counties.
	Tar River	Ma	1,194	6,672	14,588	Granville, Vance, Franklin, and Nash Counties; part of Person County.
	Broad River	Ma	846	5,477	9,879	Rutherford, Polk, and Cleveland Counties; part of McDowell County.
	Catawba	Ma	1,331	9,233	11,184	Catawba, Burke, McDowell, Caldwell, and Alexander Counties.
	Dan River	Ma	1,166	6,701	13,846	Caswell, Rockingham, and Stokes Counties; part of Person County.
	Middle Yadkin	Ma	1,468	10,166	13,984	Cabarrus, Davidson, Davie, Rowan, and Iredell Counties.
	Neuse River	Ma	1,732	10,744	20,538	Wake, Durham, Orange, Johnston, and Wilson Counties.
	Haw River	Ma	1,715	11,583	14,746	Alamance, Guilford, and Chatham Counties.
	Lower Catawba	Ma	806	5,318	7,978	Gaston, Lincoln, and Mecklenburg Counties.
	Upper Cape Fear	Ma	952	5,273	8,212	Lee, Moore, and Harnett Counties.
	New River	Ma	423	5,030	5,843	Alleghany and Ashe Counties.
Total	13	.....	14,982	.....	.....	
North Dakota	Arnegard-Alexander	Ma	827	1,020	1,020	Part of McKenzie County.
	Kidder County	Ma	576	403	1,039	Part of Kidder County.
	Slope-Hettinger	Ma	1,014	1,011	4,082	Part of Slope and Hettinger Counties.
	Little Muddy	Ma	472	839	1,798	Part of Williams County.
	Cedar	Ma	307	144	144	Part of Grant and Sioux Counties.
	Walsh County	Ma	461	1,356	1,827	Part of Walsh County.
	Wells County	Mab	829	1,600	3,000	Part of Wells County.
	Fort Berthold	Ma	438	782	1,697	Part of Mountrail County.
	North Central	Mab	937	2,127	3,402	Part of Benson and Towner Counties.
	Mouse River	Mab	558	1,021	1,049	Part of Bottineau and McHenry Counties.
	Turtle Mountain	Ma	545	1,232	1,264	Part of Bottineau County.
	Nelson County	Mab	645	1,125	1,352	Part of Nelson County.
	Grand Fork	Mab	553	1,302	1,302	Part of Grand Forks County.
	Sargent County	M	184	.....	.....	Part of Sargent County.
	South Burleigh County	Ma	563	598	2,200	Part of Burleigh County.
Total	15	.....	8,909	.....	.....	
Oklahoma	Konawa	Ma	678	4,105	4,342	Part of Pottawatomie, Seminole, and Pontotoc Counties.
	Arkansas-Verdigris	Ma	611	4,067	4,294	Tulsa County; part of Wagoner and Roger Counties.
	Kiamichi	Ma	510	3,522	3,642	Choctaw County.
	Garvin-Murray	Ma	795	3,989	4,094	Garvin and Murray Counties.
	North Fork of Red River **	Mab	810	3,125	3,345	Beckham County; part of Washita County.
	Upper Washita **	Mab	1,729	4,495	5,421	Roger Mills County; part of Custer and Washita Counties.
	McIntosh County	Ma	259	1,248	1,513	Part of McIntosh County.
	East Central Oklahoma **	Ma	1,399	5,391	5,409	Part of Haskell, LeFlore, Latimer, and Pittsburg Counties.
	Gaines Creek	Ma	995	3,527	3,722	Part of Pittsburg and Latimer Counties.
	Cottonwood Creek	Ma	473	1,981	2,316	Logan County.
	Stephens County	Ma	574	2,471	2,592	Stephens County.
	Creek County	Ma	616	2,769	3,156	Creek County.
	Arbuckle	Ma	785	3,391	3,489	Carter County; part of Johnston County.
	Jackson County	Mab	498	1,932	2,048	Jackson County.
	Farm Security	Mab	339	1,191	1,248	Harmon County.
	Canadian-Walnut	Ma	360	1,981	2,266	McClain County.
	Central North Canadian	Mab	405	1,471	1,672	Part of Blaine and Canadian Counties.
	Muskogee-Okmulgee	Ma	602	3,658	4,070	Muskogee County; part of Okmulgee County.

TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soil conservation districts established to Dec. 15, 1941*—Continued

State	Name of District	See Note for symbols	Approximate acreage	Approximate number		General location
				Operating units	Farms	
			Thousands			
Oklahoma	Blue and Boggy	Ma	794	3,921	4,076	Coal County; part of Pontotoc and Johnston Counties.
	Checotah	Ma	194	1,009	1,141	Part of McIntosh County.
	Harper County	Mab	661	769	945	Harper County.
	Verdi-Grand	Ma	122	721	913	Part of Wagoner County.
	Atoka County	Ma	638	1,921	2,069	Atoka County.
	Northern Hughes County**	Ma	538	2,554	2,740	Part of Hughes County.
	Little River	Ma	523	3,521	3,984	Part of McCurtain County.
	Grady County	Ma	653	2,892	3,148	Part of Grady County.
	Okfuskee	Ma	335	2,491	2,657	Okfuskee County.
	Seminole County No. 1	Ma	250	1,601	1,696	Part of Seminole and Pottawatomie Counties.
	Red River Valley	Ma	244	1,296	1,414	Love County.
	Arkansas River-Kay County	Ma	175	689	799	Part of Kay County.
	Big Pastures and West Tillman.	Mab	553	2,004	2,119	Part of Tillman County.
	Mayes County **	Ma	432	2,349	2,534	Mayes County.
	East Garfield County	Mab	150	664	783	Part of Garfield County.
	Cleveland County	Ma	355	1,994	2,061	Cleveland County.
	Shawnee	Ma	207	1,115	1,402	Part of Pottawatomie County.
	East Canadian County	Mab	301	1,099	1,218	Part of Canadian County.
	Valliant	Ma	116	354	443	Part of McCurtain County.
	Okmulgee County	Ma	400	2,098	2,391	Part of Okmulgee County.
	Bryan County	Ma	594	3,396	3,512	Bryan County.
	Sequoyah County	Ma	444	2,302	2,504	Sequoyah County.
	Cherokee County	Ma	493	2,391	2,507	Cherokee County.
	Lincoln County	Ma	614	3,514	3,862	Lincoln County.
	Mountain View	Mab	230	953	1,003	Part of Washita and Kiowa Counties.
	Pushmataha County	Ma	915	1,795	1,919	Pushmataha County.
	Texas County	Ma	1,322	.....	1,408	Texas County.
	Craig County	Ma	484	1,849	2,156	Craig County.
	Marshall County	Ma	268	1,112	1,252	Marshall County.
	Ellis County	M	774	1,310	1,443	Ellis County.
	East Beaver County	M	493	.....	.....	Part of Beaver County.
	Greer County	.....	412	1,501	1,674	Greer County.
	Payne County	.....	434	2,380	2,543	Payne County.
	North Caddo County	.....	137	691	752	Part of Caddo County.
	Delaware County	.....	508	2,310	2,683	Delaware County.
	Dewey County	.....	633	1,721	1,931	Dewey County.
	Rogers County	.....	454	1,876	2,049	Rogers County.
	Oklahoma County	.....	367	2,380	2,814	Part of Oklahoma County.
Total	56	.....	29,655	.....	.....	
Oregon	South Tillamook	Ma	20	82	98	Part of Tillamook County.
	Necanicum	Ma	5	13	14	Part of Clatsop County.
	Warrenton Dune	M	5	9	19	Do
	Keating	M	250	124	124	Part of Baker County.
	Langell Valley	Ma	33	95	95	Part of Klamath County.
	Heppner	.....	702	400	660	Part of Morrow and Umatilla Counties.
Total	6	.....	1,015	.....	.....	
Pennsylvania	Black Lick	Ma	220	1,095	1,200	Part of Indiana and Cambria Counties.
	Lancaster	Ma	184	2,139	2,930	Part of Lancaster County.
	Clarion	Ma	385	2,089	2,199	Clarion County.
	York	Ma	307	4,186	4,186	Part of York County.
Total	4	.....	1,096	.....	.....	
South Carolina	Upper Savannah	Ma	1,246	6,310	13,252	Anderson, Oconee, and Pickens Counties.
	Edisto	Ma	2,299	8,626	13,559	Aiken, Barnwell, Allendale, Bamberg, and Orangeburg Counties.
	Broad River	Ma	1,113	5,270	11,346	Spartanburg, Cherokee, and Union Counties.
	Catawba	Ma	1,583	4,920	10,696	York, Chester, Lancaster, and Fairfield Counties.
	Lower Saluda	Ma	979	4,198	7,476	Newberry, Saluda, and Greenwood Counties.
	Congaree	Ma	1,186	5,466	7,091	Richland, Lexington, and Calhoun Counties.
	Savannah Valley	Ma	566	1,475	3,441	Edgefield and McCormick Counties.
	Greenville County	Ma	505	3,233	5,607	Greenville County.
	Laurens County	Ma	456	1,522	3,285	Laurens County.

TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soil conservation districts established to Dec. 15, 1941*—Continued

State	Name of District	See Note for symbols	Approximate acreage	Approximate number		General location
				Operating units	Farms	
			Thousands			
South Carolina	Abbeville County	Ma	326	1, 106	2, 474	Abbeville County.
	Lynches River	Ma	1, 206	5, 278	7, 943	Lee, Kershaw, and Sumter Counties.
	Pee Dee	Ma	1, 165	4, 684	9, 342	Darlington, Marlboro, and Chesterfield Counties.
Total	12		12, 630			
South Dakota	Brown-Marshall	Mab	205	310	450	Part of Brown and Marshall Counties.
	Tri-County	Ma	1, 033	450	500	Part of Meade, Ziebach, and Perkins.
	Tulare-Redfield	Mb	183	334	340	Part of Spink County.
	Brule-Buffalo**	Ma	395	488	496	Part of Brule and Buffalo Counties.
	Clearfield-Keyepaha	Ma	211	289	335	Part of Tripp County.
	American Creek	Ma	439	532	539	Part of Lyman County.
	Silver Creek	Mab	237	648	972	Part of Sanborn County.
	Emanuel-Choteau Creek	Ma	203	875	925	Part of Charles Mix and Bon Homme Counties.
	Clay County	Ma	138	571	593	Part of Clay County.
	Sioux-Brule	Ma	186	1, 000	1, 022	Part of Union County.
	Pennington	Ma	83	92	100	Part of Pennington County.
	Lawrence-Butte	Ma	255	696	725	Part of Lawrence and Butte Counties.
	Custer County	Ma	357	215	240	Part of Custer County.
	Carpenter County	Mab	207	398	450	Part of Beadle, Clark, and Spink Counties.
	Elk Creek	Ma	195	160	175	Part of Meade County.
	Lincoln	Ma	56	289	304	Part of Lincoln County.
	Rosebud	Ma	26	38	42	Part of Todd County.
	Roberts	Ma	361	1, 684	1, 800	Part of Roberts County.
	Scotland	Ma	192	580	675	Part of Bon Homme County.
	Fall River	Ma	191	225	225	Part of Fall River County.
	Jackson County	M	395	287	400	Jackson County.
	Minnehaha		141	646	646	Part of Minnehaha County.
	Gregory County		87	153	307	Part of Gregory County.
Total	23		5, 776	10, 314	11, 615	
Tennessee	South Lauderdale	Ma	90	932	968	Part of Lauderdale County.
	Sumner Highland Rim	Ma	130	2, 049	2, 583	Part of Sumner County.
	Reelfoot Creek	Ma	97	638	803	Part of Obion County.
	Gibson County	Ma	405	5, 436	6, 227	Gibson County.
	Weakley County	Ma	371	4, 525	4, 686	Weakley County.
	Putnam County	Ma	257	2, 550	3, 349	Putnam County.
	Rutherford County	Ma	394	3, 325	4, 450	Rutherford County.
	Robertson County	Ma	281	2, 564	3, 668	Robertson County.
	Madison County	Ma	353	2, 652	4, 151	Madison County.
	De Kalb County	Ma	199	1, 996	2, 765	De Kalb County.
	Hardeman	Ma	440	2, 070	2, 961	Hardeman County.
	Crockett County		171	2, 250	2, 748	Crockett County.
	Dyer County		320	2, 700	3, 217	Dyer County.
	Warren County		227	2, 700	2, 777	Warren County.
	Tipton County		283	2, 438	4, 166	Tipton County.
	White County		232	2, 100	2, 196	White County.
Total	16		4, 250	40, 925	51, 715	
Texas	Hays-Caldwell-Travis	Ma	848	3, 879	4, 114	Caldwell County; part of Hays and Travis Counties.
	Duck Creek	Ma	1, 116	1, 850	1, 979	Part of Dickens, Kent, and Stonewall Counties.
	Nacogdoches County	Ma	817	4, 670	4, 974	Nacogdoches County; part of Rusk County.
	Kaufman-Van Zandt	Ma	736	5, 562	5, 689	Kaufman County; part of Van Zandt County.
	Harrison County	Ma	558	4, 582	5, 306	Harrison County.
	Hamilton-Coryell	Ma	1, 229	4, 300	4, 600	Hamilton and Coryell Counties.
	Central Colorado	Ma	1, 168	2, 859	3, 011	Coleman County; part of Callahan, Taylor, and Runnels Counties.
	Martin-Howard	Ma	1, 232	1, 474	1, 595	Martin County; part of Howard, Glasscock, and Midland Counties.
	Karnes County	Ma	1, 296	3, 501	3, 795	Karnes and Bee Counties; part of Goliad County.
	Bowie County	Ma	559	3, 310	3, 892	Bowie County.
	Shelby-Panola	Ma	1, 168	7, 180	8, 703	Shelby and Panola Counties; part of Rusk County.
	Sabine River-Cypress	Ma	662	4, 820	5, 227	Upshur and Gregg Counties; part of Smith County.
	Anderson-Houston	Ma	580	3, 183	3, 656	Part of Anderson and Houston Counties.
	Dallam (WED)	Ma	980		473	Dallam County.
	Deaf Smith (WED)	Ma	991		854	Deaf Smith County.

TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soil conservation districts established to Dec. 15, 1941*—Continued

State	Name of District	See Note for symbols	Approximate acreage	Approximate number		General location
				Operating units	Farms	
			Thousands			
Texas	Oldham (WED)	Ma	988	.....	177	Oldham County.
	Hansford (WED)	Ma	564	.....	335	Hansford County.
	Hartley (WED)	Ma	964	.....	207	Hartley County.
	Moore (WED)	Ma	589	.....	178	Moore County.
	Ochiltree (WED)	Ma	570	.....	528	Ochiltree County.
	Lipscomb Co. (WED)	Ma	572	.....	479	Lipscomb County.
	Wilson County	Ma	524	2,030	2,092	Wilson County.
	Sulphur-Cypress	Ma	738	6,015	6,021	Morris, Titus, Franklin, and Camp Counties.
	Davy Crockett-Trinity County.	Ma	1,097	4,230	5,035	Trinity County; part of Walker and Houston Counties.
	Hopkins-Rains-Wood	Ma	1,111	8,118	8,742	Hopkins, Rains, and Wood Counties.
	San Jacinto * *	Ma	1,575	4,277	5,538	Montgomery County; part of Waller, Grimes, Walker, San Jacinto and Liberty Counties.
	Ellis-Prairie	Ma	653	3,706	4,073	Part of Ellis, Hill, and Johnson Counties.
	Upper West Fork	Ma	935	3,150	3,310	Part of Archer, Young, Clay, Jack, Montague, and Wise Counties.
	Taylor	Ma	1,108	5,430	5,448	Part of Milam, Williamson, and Travis Counties.
	Palo Pinto	Ma	909	1,920	2,366	Palo Pinto County; part of Jack, Erath, and Eastland Counties.
	Floyd County	Mab	647	.....	1,317	Floyd County.
	Middle Guadalupe Basin	Ma	1,215	5,224	6,888	Gonzales and DeWitt Counties.
	Trinity-Neches	Ma	973	6,395	6,555	Henderson County; part of Van Zandt and Anderson Counties
	Little River-San Gabriel	Ma	770	3,200	3,569	Part of Bell, Williamson, and Milam Counties.
	Central Texas	Ma	784	6,578	6,973	Part of Bell, Milam, and Falls Counties.
	McLennan County	Ma	786	4,310	4,643	McLennan County; part of Hill County.
	Navarro-Hill	Ma	1,090	6,138	6,444	Navarro County; part of Hill, Ellis, Freestone, and Limestone Counties.
	Red River County	Ma	665	3,558	3,726	Red River County.
	Limestone-Falls	Ma	844	5,109	5,322	Part of Limestone, Hill, and Falls Counties.
	Dalworth	Ma	1,376	6,810	7,708	Dallas & Tarrant Counties; part of Kaufman, Johnson and Ellis Counties.
	Concho	Ma	1,088	1,390	1,422	Part of Concho, McCullock, Tom Green, and Menard Counties.
	Middle Clear Fork	Ma	848	2,411	2,513	Part of Nolan, Jones, Shackelford, Callahan, and Taylor Counties.
	Toyah-Limpia	Ma	1,126	114	133	Part of Reeves, Jeff Davis, and Pecos Counties.
	Highland	Ma	1,919	285	329	Part of Jeff Davis, Presidio, and Brewster Counties.
	Atascosa County	Ma	1,008	1,907	2,211	Atascosa County; part of Medina, Frio and McMullen Counties.
	North Texas	Ma	605	4,190	4,176	Lamar County.
	Freestone Leon	Ma	876	3,810	3,892	Part of Freestone and Leon Counties.
	Fannin County	Ma	568	4,487	4,538	Part of Fannin and Grayson Counties.
	El Paso-Hudspeth	Ma	1,376	1,063	1,111	El Paso County; part of Hudspeth County.
	Comal-Hays-Guadalupe	Ma	960	3,831	3,834	Comal and Guadalupe Counties; part of Hays County.
	Mitchell County	Ma	832	1,320	1,335	Mitchell County; part of Nolan, Scurry, and Sterling Counties.
	Cochran-Yoakum-Terry	M	1,676	.....	.....	Cochran, Yoakum, and Terry Counties.
	North Concho River	M	1,136	832	976	Part of Glasscock, Sterling, Coke, and Tom Green Counties.
	California Creek	Ma	832	2,147	2,442	Part of Haskell, Shackelford, Fisher, Jones, and Throckmorton Counties.
	Crosby County	.....	556	.....	1,288	Crosby County.
	Lubbock County	.....	556	.....	2,119	Lubbock County.
	Hall County	.....	1,122	.....	.....	Hall and Childress Counties; part of Cottle County.
	Swisher County	.....	575	.....	1,035	Swisher County.
	Blackwater Valley	.....	659	.....	820	Bailey County.
	Upper Colorado	M	568	1,640	1,646	Scurry and Borden Counties.
	San Diego-Agua Dulce	.....	947	1,897	2,052	Jim Wells County; part of Duval and Nueces Counties.
	Neches-Sabine	.....	614	5,677	5,879	Part of Smith and Van Zandt Counties.
	Bedias Creek	.....	832	3,549	3,777	Madison County; part of Grimes, Walker, and Leon Counties.
	Piney Woods	.....	398	1,810	2,162	San Augustine County.
	Bosque	M	1,203	3,810	3,827	Bosque and Somervell Counties; part of Erath County.
	Brown-Mills	.....	445	3,351	3,483	Mills County; part of Brown County.
	Upper Elm-Red	M	1,533	5,159	5,229	Cooke County; part of Grayson and Montague Counties.

TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soil conservation districts established to Dec. 15, 1941*—Continued

State	Name of District	See Note for symbols	Approximate acreage	Approximate number		General location
				Operating units	Farms	
			Thousands			
Texas	Upper Leon	M	1,036	4,350	4,391	Eastland County; part of Comanche and Erath Counties.
	Miller-Brazos	.....	871	968	975	Part of Baylor, Throckmorton, Stephens, and Shackelford Counties.
	Denton-Wise	.....	784	4,091	4,137	Denton County; part of Wise County.
	Hood-Parker	.....	819	3,254	3,545	Hood and Parker Counties.
	El Dorado Divide	.....	1,127	649	652	Schleicher County; part of Tom Green County.
	Upper Sabine	.....	572	4,381	4,462	Hunt County.
Total	73	.....	66,054	.....	.....	
Utah	Minersville	Ma	43	52	61	Part of Beaver and Iron Counties.
	Price River Watershed	Ma	1,217	380	535	Carbon County; part of Duchsene, Utah, Wasatch, and Uintah Counties.
	Enterprise	Ma	183	73	93	Part of Iron and Washington Counties.
	LaVerkin and Ash Creek	Ma	201	160	203	Part of Iron and Washington Counties.
	Grantsville	Ma	45	180	180	Part of Tooele County.
	Huntington River	Ma	439	320	380	Part of Emery County.
	Morgan	Ma	298	250	250	Part of Morgan County.
	Lower Virgin and Santa Clara.	Ma	602	270	330	Part of Washington County.
	South Slope Upper Virgin River.	Ma	200	248	275	Part of Washington County.
	Northern Utah	Ma	467	700	700	Part of Box Elder County.
	East Salt Lake County	Ma	141	200	200	Part of Salt Lake County.
	West Salt Lake County	Ma	124	550	550	Part of Salt Lake County.
	Green River	Ma	1,520	80	99	Part of Emery and Grand Counties.
	San Juan County	Ma	3,500	415	507	Part of San Juan County.
	Grand County Colorado River Drainage.	Ma	1,500	127	146	Part of Grand County.
	Paria River and tributaries.	Ma	150	105	128	Part of Garfield County.
	South Emery	Ma	1,789	480	590	Part of Sanpete, Sevier, and Emery Counties.
	Uintah Basin	Ma	5,436	2,288	2,859	Part of Uintah, Grand Duchesne, and Wasatch Counties.
	Vernon	.....	20	100	100	Part of Tooele County.
	Sanpete	.....	1,030	.....	.....	Part of Sanpete County.
Total	20	.....	18,905	.....	.....	
Vermont	Poultney-Mettawee	Ma	257	850	910	Part of Rutland and Bennington Counties.
	White River	Ma	434	1,500	1,690	Part of Addison, Orange, Windsor, and Rutland Counties.
	Winooski	Ma	750	3,300	3,490	Part of Chittenden, Washington, Lamoille, and Orange Counties.
	Otter Creek	.....	850	2,700	3,000	Parts of Chittenden, Addison, Rutland, and Bennington Counties.
Total	4	.....	2,291	.....	.....	
Virginia	Tidewater	Ma	1,381	7,475	8,338	Essex, King and Queen, Caroline, King William, Hanover, Middlesex, and Mathews Counties.
	Thomas Jefferson	Ma	1,276	6,859	7,808	Albemarle, Goochland, and Nelson Counties; part of Louisa County.
	Southside	Ma	1,898	9,668	17,107	Charlotte, Halifax, Lunenburg, Mecklenburg, and Brunswick Counties.
	Natural Bridge	Ma	628	2,788	3,145	Rockbridge County; part of Botetourt County.
	Piedmont	Ma	1,172	5,903	7,434	Amelia, Nottoway, Prince Edward, Powhatan, and Dinwiddie Counties.
	Culpeper County	Ma	782	3,469	3,785	Culpeper, Orange, and Madison Counties.
	Blue Ridge	Ma	1,900	11,569	17,133	Bedford, Franklin, Henry, and Pittsylvania Counties.
	Northern Neck	Ma	506	3,446	3,886	Lancaster, Richmond, Northumberland, and Westmoreland Counties.
	Shenandoah Valley	Ma	1,204	6,760	7,603	Augusta and Rockingham Counties.
	Robert E. Lee	Ma	899	4,447	5,839	Buckingham and Campbell Counties; part of Appomattox County.
	New River	Ma	565	6,242	6,942	Carroll and Grayson Counties.

TABLE 2.—*Name, approximate acreage, number of operating units, number of farms, and general location of soil conservation districts established to Dec. 15, 1941*—Continued

State	Name of District	See Note for symbols	Approximate acreage	Approximate number		General location
				Operating units	Farms	
			Thousands			
Virginia	James River	Ma	667	3,379	3,656	Chesterfield, Henrico, and Prince George Counties.
	Lord Fairfax	Ma	278	1,488	1,674	Frederick County.
Total	13		13,156			
Washington	North Palouse	Ma	156	393	535	Part of Whitman County.
	Latah, Rock Creek	Ma	185	500	700	Part of Spokane and Whitman Counties.
	Loomis	Ma	125	140	160	Part of Okanogan County.
	Asotin County	Ma	197	170	170	Part of Asotin County.
	Puget Island	Ma	5	178	196	Part of Wahkiakum County.
	Montesano-Elma-Oakville	Ma	684	2,600	1,700	Part of Mason, Grays Harbor, and Jefferson Counties.
	Eastern Klickitat	Ma	442	125	131	Part of Klickitat and Yakima Counties.
	Underwood	Ma	319	600	700	Parts of Skamania and Klickitat Counties.
	Douglas	M	132	136	145	Part of Douglas County.
	Walla Walla		172	260	260	Part of Walla Walla County.
	Moses Coulee		186	127	131	Parts of Grant, Douglas, and Chelan Counties.
	Pine Creek	M	183	560	751	Part of Spokane and Whitman Counties.
	Wenas Valley		125	110	110	Yakima and Kittitas Counties.
	Snohomish		408	3,619	3,731	Part of Snohomish County.
Total	14		3,319			
West Virginia	West Fork	Ma	518	4,029	4,618	Harrison and Lewis Counties.
	Eastern Panhandle	Ma	357	1,823	2,068	Morgan and Berkley Counties.
	Greenbrier Valley	Ma	931	3,768	4,640	Greenbrier and Monroe Counties.
	Tygart Valley	Ma	294	2,456	3,032	Barbour County; part of Upshur County.
	Western	Ma	304	2,096	2,326	Mason County.
	Elk		415	2,035	2,277	Nicholas County.
Total	6		2,819			
Wisconsin	Crawford	Ma	371	1,925	1,960	Crawford County.
	Buffalo County	Ma	449	2,132	2,171	Buffalo County.
	Pepin County	Ma	150	1,018	1,100	Pepin County.
	La Crosse County	Ma	302	1,765	1,759	La Crosse County.
	Vernon County	Ma	522	3,919	3,979	Vernon County.
	Iowa County	Ma	485	2,640	2,765	Iowa County.
	St. Croix County	Ma	467	3,543	3,737	St. Croix County.
	Trempealeau County	Ma	475	3,050	3,278	Trempealeau County.
	Eau Claire County	Ma	411	2,421	2,504	Eau Claire County.
	Pierce County	Ma	370	3,104	3,280	Pierce County.
	Grant County	Ma	738	3,926	4,286	Grant County.
	Dunn County	Ma	550	3,600	3,800	Dunn County.
	Jackson County	Ma	639	2,073	2,205	Jackson County.
	Dane County	Ma	765	5,835	6,250	Dane County.
	Waushara County	Ma	402	1,852	2,650	Waushara County.
	Barron County	Ma	561	4,700	5,112	Barron County.
	Monroe County	Ma	583	3,530	3,591	Monroe County.
	Richland County	Ma	377	2,557	2,592	Richland County.
	Sauk County	Ma	537	3,552	3,642	Sauk County.
	Juneau County		511	2,446	2,545	Juneau County.
	LaFayette County	M	401	2,404	2,602	LaFayette County.
	Polk County		594	4,500	4,868	Polk County.
	Chippewa County		662	4,250	4,539	Chippewa County.
	Clark County		779	5,573	5,845	Clark County.
	Marathon County		1,009	6,937	7,198	Marathon County.
	Wood County*		520	3,568	3,728	Wood County.
	Dodge County*		571	4,602	4,864	Dodge County.
Total	27		14,201			
United States	653 (549 M with 337,525,000 acres.)		382,629			

Ice plant protecting roadcut from erosion, Skyline Boulevard.

CONSERVATION COMES TO THE GOLDEN GATE

By H. H. BENNETT Chief, Soil Conservation Service

IN THE hill country of San Mateo County, not far from world-famed Golden Gate, cabbages and artichokes grow to luscious and profitable proportions. Gullies form there too—lusty fellows—if left to their own devices, under the wasteful land-use practices that have prevailed.

Dairying is an important agricultural activity also, and they raise hogs with garbage trucked in from the metropolitan area of San Francisco, immediately to the north. Selling topsoil to city people is another important business with some landowners. We saw them bull-dozing rich, black loam from good farm land and hauling it to town where it was spread over "blow sand" of front and back yards of scores of new houses along brand new streets building up across the wind-whipped dune sands of the locality. A 6-inch layer of it, we found, effectively holds the fickle sands and produces beautiful grass, flowers, and shrubs.

But the subsoil, exposed by the stripping process, produces little or nothing and erodes with extraordinary violence. Rains gut it rapidly and deeply; and troublesome silt is added to that pouring from other exposures.

Harvesters of topsoil take their pay in money; while the afflicted community takes on the resultant burden of handling the products of erosion spread over highways, parks, and baseball fields and dumped into creeks and culverts.

The San Mateo Soil Conservation District has posted signs over the countryside promising prosecution of those who take topsoil at will from public property. Neither salesmen of topsoil, however, nor those who take sacks and trailer loads of topsoil when no one is around to object are responsible for the main erosion problem of the locality.

The principal starting place of the difficulties arising out of uncontrolled soil erosion is in the rows of cabbages and artichokes that run downhill, and in the fields of cabbages and artichokes left bare over winter. Here begin most of the gullies that have been permitted, even thoughtlessly encouraged, to run along as they choose.

I was not prepared for any such dimensions as we found in some of those California gullies. To me—and I had told a lot of people about it—the great gully over in southwestern Georgia, Providence Cave, was the most formidable man-caused gash in the body of the Western Hemisphere. Well, Providence Cave was just that, so far as I knew, until October 24, 1941, when we ran into the gullies of San Mateo. It must

Gullying of subsoil, after topsoil has been stripped off for sale, San Mateo County.

be admitted, however, that we do not yet have the final answer as to comparative sizes. It is not easy to measure the depth of such big gullies; they gape and sprawl about so you don't know where to place your benchmarks. After all, precise measurements are not so important, since both the Georgia and California chasms belong to the order of Grade A gullies.

According to Coast and Geodetic and United States Geological Survey maps, and rechecks with instruments, Sir Francis Drake Gully seems to be about 275 feet deep. This one heads in the cabbage and artichoke patches about 10 miles south of the center of the Golden Gate Channel and empties into the Pacific Ocean. Local information puts its age at less than 50 years.

The proprietor of Gopher Hole, another whiz of a gully not far from the Sir Francis Drake, estimates its depth at 245 feet. The owner said: "As a boy I played all over where that gully is. It was just a smooth hillside then. The washing started in a gopher hole about 35 years ago."

"Any of your cows ever fall in it?" I inquired.

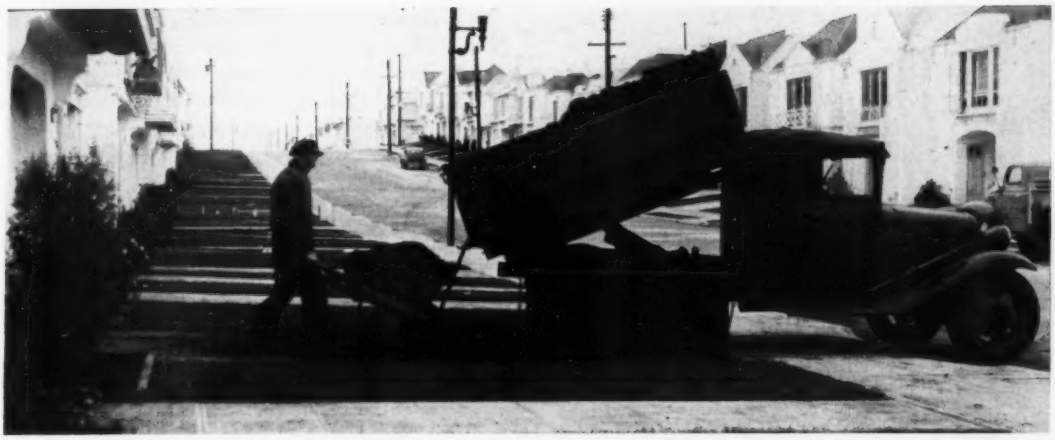
"Oh yes; several times. But they are pretty careful generally. Those that went down were accidentally pushed in by other cows. Thus far, they've landed on benches where we've been able to rescue 'em. But 2 weeks ago one of my cows was killed by falling into the gully on the other side of the ridge." I forgot to ask the depth of the gully on the other side, but it was on the same dairy ranch.

The truck farmers were not so easy to talk to. They were busy harvesting cabbages and irrigating artichokes; some disclaimed acquaintance with the English language. What is more important is that some 35 of the local farmers and dairymen are cooperating with the soil conservation district. W. G. Scott of the Service has drawn up conservation plans for these ranches and is now assisting the district in getting control measures applied to the land—mostly contour cultivation, winter cover crops, mulching with straw, crop rotations, vegetative plantings, drainage (artichokes do not like soggy ground), and and improvement of irrigation practices.

Erosion control work in the San Mateo District does not stop with the farmers but extends to cooperation with county authorities in the protection of highways. I was told that $100,000 will be made available by county and highway officials for the protection of Junipera Serra Boulevard. About $10,000 of this is being used by the Soil Conservation Service for installing eight silting basins above the road fill. With "risers" for the culverts, the silt will be retained from eight bad gullies tributary to Colma Creek. Veritable deluges of sand have been pouring out from the highly erodible strata exposed in the gullies and along highways.

I was told that during the past 8 years $400,000 has been spent in handling flood waters and erosion debris along Colma Creek. This creek flows through South San Francisco. A channelway about 12 feet deep was recently opened through the accumulated sand, which has now piled up to a depth of 25 to 30 feet—within the memory of people living near the stream. This channelway has been lined with rock along its bottom and lower sides, but still sand pours in with every rain.

To hold back in-flowing sand the walls of a local pump house have been raised twice within 35 years. Near this point barges once brought feed from the



Hauling topsoil into the backyard of a home on 35th Avenue near Noriega in San Francisco.

bay up to the Charles Lux ranch. Now the nearest navigable water for any kind of boat is nearly a mile away—the waters of San Francisco Bay.

We also looked over the work being done for control of erosion and prevention of silting on the watersheds of the five reservoirs of the East Bay Municipal Utility District. This district supplies water to an urban population of some 600,000 people and to the huge, widespread industrial plant of the East Bay section. The East Bay District uses not only the run-off from the 55,000 acres within the watersheds of its five reservoirs but pipes in by gravity hundreds of millions of gallons from the foothills of the Sierras, 93 miles away.

One of the reservoirs, at the time of a recent survey, had the highest silt-producing rate shown by any sedimentation survey in the country. The investigation revealed a rate of sedimentation equal to the removal of around 9 tons of soil per acre per annum.

Here, the principal source of erosion is the slide areas. Some of the more recent of these have reached down to reservoir water. Much of the trouble has been caused by the washing that takes place within and around the slide areas. Erosion along highways and in overgrazed pastures also contributes much of the silt.

The plans for control operations were prepared by the Soil Conservation Service.

A number of silting basins already have been installed (two that we saw have collected enough silt to fill up) and much control work has been done on road fills. About 1,200 acres of steep erodible land are being planted to trees, 150 check dams are being put in (some of which will probably cost $500 to $1,000), grazing and fires are being controlled, and cover crops used on the cultivated areas.

Leaving this difficult but essential erosion-control project to see some of the work in Walnut Creek and San Ramon Valleys, we passed an interesting conservation operation in progress at Lafayette. Here two stone-masonry dams were being installed in the expanding channel of Trampos Creek. The accelerated erosion at this point was about to take out an important county bridge 1,000 feet upstream and was threatening the property, valued at $125,000, of 25 people living along the banks of the stream. The Service designed the structures and furnished stone mined by a CCC camp; the property owners paid for the cement and other materials, and the county was supplying the labor and installing the structures.

Among several farms visited farther on, where soil and water conservation plans had been installed, I was particularly impressed with results obtained on a 1,200-acre ranch in San Ramon Valley. On this ranch a stockwater reservoir, installed by placing an earth dam across a small waterway which for many years had been flooding out an adjoining 175-acre field of rich bottomland, has provided adequate protection for the flooded field. A diversion ditch now carries the excess water from the reservoir to a safe disposal outlet. As the result of these water-control and water-supply installations, the flat which hitherto has grown little or nothing, produced this year 30,000 pounds of vetch seed that sold for 5½ cents a pound; 140 tons of hay that brought $11 a ton; and a rental return of $1 an acre for temporary grazing. In 1941 the total income from this previously useless field amounted to $3,365. Nor did this cover all the increased income resulting from the soil and water conservation work. For example, the development of spring water on another part of the farm made it

possible to utilize profitably for grazing a previously unused area of 500 acres.

The day after the visit to these farms I undertook to tell members of the natural resources section of the California Chamber of Commerce how simple the job of soil and water conservation is in some places and how complex and difficult it is in others; how the work has increased income to farms and ranches and benefited the general welfare; and something of the cost of not controlling erosion. Afterwards, a member of the board of supervisors of one of the larger southern California counties told me his county would contribute $100,000 to assist in the control of erosion as soon as a soil conservation district is established there, which he thought would be very soon.

Another gentleman told me that after the severe erosion during the early part of 1941, farmers and ranchers of the same county had requested a reduction of assessments on their lands because of the washing of uplands and the covering of valley farms with the products of erosion. One county was prepared, I was informed, to contribute probably $300,000 to erosion control and related activities.

Up in the Placerville locality, north of Sacramento, one occupant of the land did not seem as much concerned as we were about the erosion taking place on the pear and peach ranch where he lived—we could not convince him that gold from pears is better than gold taken from gullies. He expressed his opinion this way: "It takes a lot of work to keep up a big orchard and when you go financially flat for one cause or another this soil washing is a good thing, because you don't have to dig so much to get down to gold. There's gold all over this orchard, but I haven't yet found where it is concentrated. I planted pears in this field 20 years ago and the peaches over there 3 years ago. You can find fruit trees even in those pines over beyond the house. The place has been in fruit for probably 70 years."

When we met this pear and peach rancher coming in from his gold digging in the severely gullied, bush-invaded, 20-year-old pear orchard, he had a small sack of gold dust or "pay dirt" on his shoulder. He said this would pay him at the rate of $1 to $3 a day when washed out at the spring.

He did not seem especially enthusiastic over the suggestion that it might pay to prune and take more care of the better pear trees on the less eroded parts of the farm. In search of gold, he had made so many excavations that the going was not very good—I was dodging invading clumps of poison oak and the ever-deepening exploratory gold holes until finally they turned me back. If a man wants to take his gold where he finds it perhaps there is little that can be done about it.

Not so with Roy Marks, president of the Central Eldorado Soil Conservation District, over on the other side of Placerville. Roy has gone in for soil conservation so completely that he not only never plows his pear orchard any more but he gets good grazing for sheep from the protective cover of grass that has been established between the trees. His irrigation water comes from a ditch maintained by himself and six neighboring farmers. "We used to clear the ditch of silt every year," he said. "We must have thrown out of it all the topsoil of three ranches. Now you couldn't grow a bale of hay on 20 acres of some of those places that used to be good ranches."

Roy Marks' story is interesting. This is the way he told it: When the Soil Conservation Service first came in here it was hard to get an application for work from a rancher, but now we don't have any trouble of that nature. Everbody wants to come in. Most people have quit the cultivating they used to do. We used to make a powder of our soil and kill every weed and sprig of grass in the orchards. Now the only cultivation we use is just enough to put in irrigation ditches.

"When I stopped plowing my orchard, the neighbors said I was neglecting my ranch. No complaint now though, even with sheep roving in the orchard. They don't hurt a thing, but take out a lot of weeds and pack down the grass so as to make a mat that helps hold irrigation water and keeps moisture in the ground. The yields are not harmed in the least by keeping on a cover crop. My irrigation furrows used to cut out a ditch sometimes 2 feet deep in a season. I don't have any more of that waste of good soil now.

"Soil conservation pays not only for this generation but for the next. But a farmer can't apply these conservation practices unless someone who knows comes and helps him. A farmer who does his own work on the ranch does not have time to go out and learn how to do these things, although he can handle them when he gets properly started and works with them for a while."

Someone pointed out that the sheep eat a lot of fallen pears, and thus help keep down the coddling moth. At any rate, with the good crop and the good prices, ranchers around Placerville generally are taking to the new methods as fast as they can get them established.

The Central Eldorado District comprises 30,000 acres and about 300 farms—nearly all of them irrigated fruit ranches. Five years ago, I was told, probably

half the growers clean-tilled their orchards; now not more than 5 percent practice clean tillage. The planting of protective cover crops began in 1936.

Some of the ranchers have gone in for farm forestry. The income from such woodland operations on 16 ranches in the Placerville locality has ranged from $50 to $1,500 per ranch annually. This was income that did not come in before Soil Conservation Service technical help was supplied.

I talked with Dan Gardner about his farm forestry operations. We met him out in his woods—mostly cut-over western yellow pine, with some Douglas fir—with a truckload of firewood he had just cut. I asked him point-blank, right on the ground, if the Service woodland assistance had been satisfactory. "Yes it has," he came back instantly. "From this assistance I got $768 net income the first year, not a penny of which I would have received but for the help of the Soil Conservation Service. I like the work of your Service, all of us do, and we like the technicians helping the district."

At this junction Mace Lumsden, district conservationist, said, "Dan, I think we are going to get you another order for fence posts, maybe a good one. It looks pretty sure."

Alfred E. Coe, Jr., a deputy sheriff, sees to it that topsoil isn't stolen in the San Mateo Soil Conservation District. He patrols at least once a day, and on Saturdays, Sundays, and holidays makes three patrols. Those caught helping themselves to the rich loam receive a warning if they are first offenders. A second offense is prosecuted.

Excellent cabbages from rich, loamy topsoil along Skyline Boulevard, San Mateo County, October 1941.

That obviously was good news for Gardner. I had to satisfy my curiosity about those posts: It turned out that during the past year 656 yellow pine fence posts, treated with zinc chloride, were sold from the Gardner ranch for 45 cents each—a very profitable transaction, everyone felt.

As to further operations, the farm forestry specialists who drew up the forest operations plan for the Gardner ranch figure that on a sustained-yield basis the 240 acres of second-growth woodland should yield a net annual income of at least $700—for fuel wood, poles, lumber, mine timber, Christmas trees, and Christmas berries. If the sale of treated fence posts becomes a regular thing, the returns should be better still. Furthermore, cream is being sold from the 8 to 10 dairy cattle kept on the Gardner ranch; and there is an excellent farm garden.

A considerable number of "overnight reservoirs" have been constructed in the Placerville section for making better use of irrigation water. An inheritance of the placer mining culture of Hangtown's gold-mining days (Hangtown is an old name for Placerville) was the *miners inch*. Water is still sold on that basis in this locality; that is, you pay so much for a stream of water that runs all day and night at the rate of 11 gallons a minute. The orchardists turn the water on and let it run day and night—and never have sufficient "head" to irrigate efficiently. The continuous trickle causes a lot of unnecessary wastage of water, as well as soil leaching. With the overnight reservoir, a simple earthen structure thrown up like a pen to hold the *miners inch* during the night, enough water is available next day to make a quick and efficient application.

We took the road leading into the high Sierras, spending the night at Strawberry Lodge, 18 miles from Lake Tahoe, at an elevation of nearly 6,000 feet. It was dark most of the way up. Twice deer threatening to cross the road ahead of us necessitated quick application of brakes.

Next day was Sunday and we spent most of it across the divide in Nevada. It was a perfect day. The high Sierras were tipped with new snow. Here and there autumn gold of aspen painted the high slopes so beautifully against a background of green conifers and snowy peaks that our photographer could not resist taking colored shots of the brilliant scenes. Lower down, along the valley floor, ribbons of equally golden cottonwood followed the meanders of Walker River and its tributaries. Sunlight on the trees covered them with magical beauty.

Atmosphere and sunshine were patterned perfectly for a late October day. A little walking here and there had tuned up the appetite. We ordered a second breakfast at Minden, in Carson Valley. Then, duly reinforced, we were back to the objectives of the day: a look at problems of high water-table due to over-irrigation or lack of drainage outlets, or both, and the resultant deterioration of alfalfa fields; neglected and eroding irrigation ditches; great quantities of unused ranch fertilizer; irrigation ditches improperly safeguarded from the destroying effects of mountain torrents and the effectiveness of the measures used to solve these problems.

We saw the good effects of manure used on alkali spots, and eroding irrigation ditches stabilized with check dams and properly installed flumes. At Wellington, in Smith Valley, we saw two irrigation canals that had been protected from mountain torrents by structural overpasses made of cement.

On several ranches that we visited, irrigation practices had been improved by shortening the run and distributing water more nearly on the contour. We saw sloping, erodible land that had been brought into productive use under controlled irrigation, and pastures improved by seeding better grasses and legumes and by rotation with tilled crops. We saw also tree plantings, new gardens, and preparations for lowering the water table by drainage.

It was in Carson Valley, at the headquarters corral of a large ranch, that we saw areas occupied by huge piles of manure, the accumulation of decades. Someone referred to them as "the brown sierras." An estimate of the accumulation at this one place was the amazing quantity of 750,000 tons. At other corrals on the same ranch enough was found to bring the amount to a million tons. In other words, this one ranch had on hand enough manure to fertilize 100,000 acres at the rate of 10 tons per acre! Some of the older accumulations undoubtedly have deteriorated, but even this has been found to have considerable fertilizing value. Ranch manure is now being used on an increasing scale, according to local report, for both pasture and wheat land.

The day's journey took us by the ancient mining town of Virginia City. The old place, which a little while ago was a ghost town, and mining operations over a wide surrounding territory, have come into a very lively renaissance as the result of increased price for gold. At a distance the piles of freshly excavated material about the mouths of new openings and in nearby dump-heaps were suggestive of gopher operations on a grandiose scale.

To end this western trip, I'll stop with the beginning incident: On the way out, I attended the annual State meeting of the supervisors of soil conversation

districts, at Grand Junction in Colorado. The discussions and district reports revealed the keenest kind of interest in ways and means for getting more soil conservation of a permanent nature, more conservation of water and better land use, through increased assistance to districts on the part of all agencies having anything to do with the land. The spirit of cooperation pervaded the meeting. There was no question about the success of the soil conservation district movement in Colorado or the determination of district supervisors to make them increasingly useful to the people.

The experience of the Horse-Rush Creek Soil Conservation District in leasing tax-delinquent lands from the county commissioners of Elbert County stands out in my recollection of the proceedings. This lease, as reported at the meeting, had just been signed by R. W. Lambert, chairman, Board of Elbert County Commissioners, and N. N. Bailey, chairman of Horse-Rush Creek Soil Conservation District.

Of some 50,000 acres of tax-delinquent land, the soil conservation district had leased 12,160 acres in 59 different tracts which had paid no taxes for 5 years or more. The terms for payment in all instances were based on the use capabilities of the land. For classes III and IV lands the district agreed to pay the county 8 cents an acre for 3,660 acres for pasture or range use; 10 cents an acre for 566 acres for crop use; and 4 cents an acre for 3,809 acres of abandoned land. For classes VI, VII, and VIII land the rates were fixed at 6 cents an acre for pasture or range use and 2 cents an acre for abandoned land.

Under the district program these lands are to be safeguarded against erosion and improved in every practical way in the interest of more profitable use.

Thus, the ways of soil conservation are leading us in the direction of a permanent basis of productive soil, for permanent agriculture all the way to the vicinity of the Golden Gate.

Poorly drained land being cleared.

LAND FOR MORE PEOPLE IN THE MISSISSIPPI DELTA

(Continued from back cover)

fields, are seen along or close to well-designed concrete highways and within a few miles of thriving communities.

To one interested in land drainage these conditions are of particular significance. Formerly this section of the State was subjected to overflow from the Mississippi and tributaries such as the St. Francis, White, and Arkansas Rivers and was largely classed as swamp land. Very little of this overflow land was suitable for cultivation in its original state. Levees were constructed to prevent the major rivers from overflowing and they now protect most of the area. The Mississippi River Commission, the Corps of Engineers, United States Army, and many privately financed drainage districts have built levees, the work extending over a long period of time. Since the disastrous flood of 1927 the Army engineers have been working on an adequate system of levees to hold back the flood waters. These levees now protect most of these lands and afford better flood protection to people living in the area than they ever enjoyed before.

In leveed areas during floods, when there is danger of a major levee break, there is confusion comparable to a civilian population fleeing before an invading army. Roads are filled with refugees, some in automobiles, some in wagons, and some on foot, driving stock and carrying every conceivable kind of bedding and other household and personal belongings. In many areas in Arkansas, formerly subject to periodic floods and to evacuation, the new and adequate levees give a sense of security for life and property which is reflected in the confidence of the people, their willingness to build better homes, farm buildings, and all types of permanent improvements.

The conditions in this section of Arkansas are typical of a large area in the Mississippi Delta in Louisiana, Mississippi, and southeastern Missouri. The Bureau of Agricultural Economics has made studies of economic problems confronting new settlers in the area, as covered by United States Department of Agriculture Miscellaneous Publication No. 442, "New Settlement in the Mississippi Delta." This publication gives information relative to the economic problems of new settlers and discusses among other problems the credit needs, the dependence upon cotton, farm organization, the importance of flood control and drainage, and the need for a coordinated program of planning and action.

One of the needs of new as well as old settlers in this area is a farm conservation program. This program

would be somewhat different from the usual soil conservation program where erosion is the principal problem. In the Delta lands drainage is one of the principal physical problems. Erosion on the farm lands in the Delta is not as severe as on rolling lands but, even so, it is enough of a problem to justify practices which will reduce soil washing to a minimum. One of the most serious problems in Delta areas is the filling of ditches with erosion debris. In many instances fertile areas of drained lands have been abandoned because of drains filling at such a rapid rate that the farmers were unable to keep them clear. A proper farm conservation program, especially on critical areas contributing silt, and the proper design and construction of drainage drains with appurtenant structures and practices along the drain will reduce siltation to a minimum and thus contribute to the proper conservation and utilization of such land.

Farm drainage is one of the soil conservation practices most needed in the Delta—this is evidenced by the large number of wet spots in the fields and the spotty crops on most of the farms. Furthermore, improved farm drainage would contribute to soil conservation and improved crop yields on many farms even where the public drains are satisfactory.

The need for soil-building practices and the working out of proper crop rotations are among the other conservation problems that should be solved to secure a permanent soil conservation program. The problem of crop rotations is influenced by the dependence on cotton as the principal cash crop. The study reported in Miscellaneous Publication No. 442 has indicated that the average distribution of crops on a Louisiana new-ground farm is about 9 acres of cotton, 10 of corn, 1½ of feed crops, 1 of truck crops, with a total of 24 crop acres. In checking the total acreage of crops in eight Arkansas counties on which I studied the Census figures, I found that less than one-fifth of the land that was used for cotton and corn in 1939 was devoted to hay.

The large community drains necessary to the proper drainage of the Delta so that farmers will have an outlet for drainage water from their farms were built by organized drainage districts. The drainage districts in Arkansas are largely within the Mississippi Delta and comprise 4,631,155 acres (1930 census) or an area almost equal in size to the whole State of New Jersey. These districts have constructed 5,000 miles of drainage ditches. They were nearly all organized between 1905 and 1924; two-thirds of the area was organized into drainage districts in the decade 1910 to 1919. Drainage districts in the Delta in Louisiana, Missouri, and Mississippi comprise additional large areas having similar problems.

These drainage districts and the flood control works proved to be the foundation for one of the major and most significant land settlements in the history of the United States. The movement of settlers into the area is still under way and there is land available for more families. A recent estimate has indicated that there are still over a million acres of land not now developed in Arkansas which could be drained and farmed. Miscellaneous Publication No. 442 estimates that the portion of undeveloped areas that could be made suitable for agriculture in the Delta as a whole under proper conditions of development would supply 80-acre farms for about 62,500 families or 40-acre farms for about 125,000 families.

After driving some few hundred miles through this area in Arkansas I felt that census figures on population, agriculture, and drainage should reveal some interesting information on this land settlement. I selected eight counties for a study of the available information—Mississippi, Poinsett, Chicot, Craighead, Desha, Crittenden, Clay, and Green Counties. The reason for this selection was that these counties have the highest proportion of land in organized drainage districts, and because of this the county totals should reflect most adequately what is occurring in the drainage districts. These counties either adjoin or are in the second tier of counties from the Mississippi River. Their combined area is 3,630,720 acres, of which 2,580,978 acres are in organized drainage districts. The 2½ million acres of drainage is a huge undertaking, and many of the most significant agricultural problems remain to be solved. In 1930 these drainage districts had a high proportion of unimproved land, including woodland and cut-over land. The census of that year listed 1,272,811 acres of unimproved land in these counties.

To get some idea of the extent of crop land being brought under cultivation, I compared the census figures for crop land harvested for the years 1929 and 1939. In the 10-year period there was an increase in the crops harvested of 323,403 acres. There is little doubt that practically all of this increase has occurred in the drainage districts. In the State as a whole there was little change in the crop land harvested between 1929 and 1939, the State totals for the 2 years being about 6,600,000 acres. This increase of about 300,000 acres in the eight counties is thus balanced by decreases in crop land harvested in other counties. In examining the county figures I observed that decreases in crop land harvested and in popula-

tion occurred in those counties where erosion is known to be particularly severe.

Soil conservation on a farm includes among other practices the retirement of eroding hill land which is too steep for continuous cultivation and shifting the cultivation to the least erodible part of a farm. In Arkansas a movement similar to this soil conservation practice is occurring on a State basis with many of the families actually abandoning eroded, worn-out farms and moving their few remaining belongings to the lowlands. The present movement is not true soil conservation because much of the hill land is destroyed before the family leaves the hill farm, and when the settler arrives at the lowland farm he may find poorly drained cut-over land, with little in the way of resources with which to develop land.

In general, the trends revealed by census information check with observations and statements of local people. The local people believe that numerous families are abandoning farms in other sections of the State and moving over to the lowlands. According to the 1940 population census, the rural population declined in 31 counties as compared with the 1930 census. In the 8 drainage counties studied the rural population increased by 28,977 persons during the decade, representing an increase of 12 percent in the counties. By comparison, the State increase in rural population was only 45,873 persons, or a 3.1-percent increase. The principal increases in rural population occurred in the counties with large amounts of drained lands being brought under cultivation and in counties adjoining urban areas such as Little Rock and Fort Smith.

Many people living in Mississippi County, the largest of the drainage counties, believe their land is endowed with unusual fertility. The principal crop is cotton, and the census reports that in 1939 this county produced 200,445 bales on 183,888 acres, or an average of 1.09 bales per acre. The yield for the counties in the drained area is far greater than the average yield of the State. We went over one drained farm in Mississippi County that yielded slightly over 2 bales of cotton per acre this year. We examined other farms where the yield has been seriously reduced because of poor drainage conditions. If proper drainage conditions could be established and farm conservation programs followed, this area would, without a doubt, become more prosperous and many more farms would be in the bale-and-a-half per acre class. The conservation program needed would include regular drainage maintenance and improvement, with proper

Plowing new ground.

Cotton growing among deadened trees.

soil-building practices so that high yields could be maintained.

Among the people with whom we talked in Mississippi County there is the impression that most of the settlers are small operators who are buying their farms. We were given a rather favorable picture of land-settlement conditions in Mississippi County—but more complete studies would be necessary to get all the facts, including the problem of meeting the debt payment. We were cited instances of farmers who came a few years ago with limited equipment and resources; some were described as "not having a dime." To illustrate, uncleared land was sold in some instances for about $25 per acre, with the settler contracting to clear reasonable acreages for the first few years and payments on principal not to start for 5 years. Many settlers who undertook deals of this kind have made excellent progress in clearing their lands of timber, in construction of farm buildings, and in maintaining their payments of interest and principal. We were cited instances in which the farm debt has been entirely paid. The Agricultural Census shows that in Mississippi County the number of farms operated by full owners increased from 873 in 1930 to 1,437 in 1940, and that there was a substantial decline in the number of tenants and croppers.

The 1940 Agricultural Census for Mississippi County reports on the mortgage indebtedness of a group of 556 farms operated by full owners who own no additional land. The average size of the farms in

this group was 73 acres, the average value $94 per acre, the average equity per farm $4,394, the average debt per farm $2,395, or $33 per acre, and the average interest rate 5.6 percent. The average debt in the county is high compared with the State average, but it is much lower than the 1930 debt and the interest rate is lower.

Although most of the Delta is fundamentally good land, is being developed, and offers a fine opportunity for many new homes, the national or State problems involved in the settlement and maintenance of the areas should not be overlooked or minimized. United States Department of Agriculture Miscellaneous Publication No. 442 gives a picture of the hardships and difficulties of new settlers of the Delta. It was found that many settlers lacked advance information about the adaptability of their soil to agriculture and the drainage and flood problems. One settler in seven is losing or abandoning his farm after the first year or two of work, and many others are threatened with such losses. High prices for land, unfavorable terms of occupancy and purchase, poor land drainage, and lack of guidance in selection of farms for settlement are problems which contribute to insecurity and weaken the system of small home ownership.

Although the agriculture in these drainage counties is undergoing a healthy growth as evidenced by information previously cited, the brief study that has been made emphasizes the importance of the many soil conservation problems requiring solution. Many of the main drainage systems have deteriorated and extensive rehabilitation work must be accomplished before proper land drainage can be secured. There is need for extensive improvement in farm drainage practices. It is believed that one of the most effective ways of helping this area would be to provide better land drainage and thus improve the earning power of farmers. With good drainage, excellent crops can be grown; with poor drainage, the economic conditions will become worse. By the application of proper farm conservation programs, including improved drainage, soil fertility can be preserved and improved. A complete conservation program embracing these and other necessary practices would be particularly helpful in assisting new settlers to succeed and become home owners.

POOLING EFFORTS

(*Continued from p. 182*)

County Highway Department. Loaned snow fence for nursery. Furnished trucking service.

Chamber of Commerce. Publicity.

Soil Conservation Service. Assisted district in preparing soil conservation plans for district cooperators. Furnished trees for erosion control. Assisted district in revising and carrying out program of work.

Civilian Conservation Corps. Made CCC camp labor available to district.

Extension Service. Educational program.

State Department of Conservation. Furnished trees for public lands. Gave technical advice on reforestation, fish and game problems.

Grand Haven Public Schools. Furnished movie for educational meetings.

Grand Haven Tribune and Muskegon Chronicle. Assisted by giving public news of activities of the district.

Telephone Company. Donated tree trimmings for brush mulch instead of burning as in the past.

EROSION CONTROL ON LAKE MICHIGAN'S CLAY BLUFFS

By B. A. MYERS [1]

FRUIT and truck crops give southwestern Michigan a multimillion-dollar industry, thanks to suitable soils and a prevailing wind that sweeps eastward across Lake Michigan to temper the climate exactly to the liking of tender peach and apple blossoms. These same winds bathe the beaches along west-coast Michigan, inviting hundreds of thousands of tourists, creating for lake-shore residents another multimillion-dollar business every summer.

Fine summer homes, thousands of them, have been built along the lake. They nestle among the sand dunes and, unfortunately, sometimes those wind-worn dunes nestle right down over these summer homes, burying them in enormous sand drifts. As the wind blows, so do the waves roll. When the winds are high, the waves charge landward, bouncing with tremendous force against towering bluffs, trees, wharves, harbors, highways, and houses.

Thus, one of the problems along this lake is the so-called "lake-shore erosion"—either wind erosion or

[1] Project engineer, Ohio Valley Region, Soil Conservation Service, Benton Harbor, Mich.

water erosion, the latter caused by intermittent wave action which often damages homes, valuable horticultural land, parks, city property, expensive highways.

In an effort to demonstrate what could be done to control this lake-shore erosion, the Soil Conservation Service, in cooperation with the Berrien County Highway Department, established, in 1938, six demonstration plots near Benton Harbor. These plots have successfully passed through two winters and a severe lake storm—one of the worst in the last decade, the storm of November 11–12, 1940.

Especially significant is the fact that already public officials are convinced of the efficiency of the methods employed in the demonstration plots, and they are effecting similar erosion control work on other sections of the lake bluff.

Before discussing the control methods used on the six plots it may be well to give a clearer picture of the problem faced by the technicians in charge.

The bluffs are composed of unweathered glacial drift of a clay nature. They erode easily. The bluffs occur in alternate stretches with sand dunes along the entire eastern shore of the lake. Undoubtedly, in times past they have receded a great distance.

Erosion on these bluffs occurs in cycles. Periods of accelerated erosion closely follow the storm cycles of Lake Michigan. Records of lake storms during the past 60 years show that those severe enough to cause undercutting at the toe of the bluff occurred in periods of 14 to 16 years.

Undercutting by the waves is serious because of the clay nature of the bluff material. This material, when exposed to alternate freezing and thawing, is susceptible to considerable heaving and slipping and, since the most severe storms on record have occurred in the fall of the year, the undercutting frequently causes the entire vegetated surface of the bluff to slip during the winter months.

If no control measures are put into effect, the scars left from the slipping are enlarged by increased frost action until the bluff assumes its natural angle of repose. Eight to ten years is probably the shortest time required for this to occur, depending on the severity of the undercutting and on the vegetative covering. This leaves approximately 5 or 6 years for natural revegetation to take place before the bluff is again undercut and the entire process is repeated.

To demonstrate control measures under varying conditions such as slope, seepage, and amount of native cover, a demonstrational area 500 feet long was subdivided into six plots. Natural boundaries were used so that the area enclosed was as nearly uniform as possible.

In addition to the six plots covering the face of the bluff proper, a strip of beach 50 feet wide and extending along the toe of the entire bluff project was used as part of the demonstration. The problem involved on this strip was to develop a vegetated foredune which would give to the base of the bluff both mechanical and vegetative protection from wave action.

On plot 1, the principal method by which vegetation was established consisted of seeding a mixture of grasses and legumes at the rate of 100 pounds per acre and mulching with marsh hay at 4 tons per acre. The mulch was held in place by used woven wire which was fastened to the ground by stapling it to live willow stakes driven 12 to 18 inches into the ground. A small diversion channel was constructed at the top of the plot area to divert storm water from the face of the plot into the highway drainage system. A post and wire dam was built on the contour across the toe of the slope. This was a living dam consisting of willow posts faced with woven wire, willow brush, and straw. The plot was planted to shrubs and trees, the upper one-third to coralberry, chokecherry, and gray dogwood; the middle third to red osier dogwood, lilac, and caragana; and the lower third to black locust.

Plot 2, which had a fair covering of native grasses, was left as a check area to determine the effectiveness of this cover as well as the extent to which shrubs and trees from the other plots would spread through natural reproduction. Barren areas were seeded and mulched in the same manner as described for plot 1.

Plot 3 included a large seep area which required the use of a mechanical drain to assist vegetation in becoming established. A 6-inch, 18-gage, perforated culvert pipe was installed for this purpose. Because the upper part of the plot was very steep, a system of contour wattles was used on the upper one-third. These wattles were constructed by digging a trench 8 inches deep and 12 inches wide to form benches 3 feet apart on the contour. Shrubs were then planted on the benches to form level living dams. This area was seeded at the rate of 50 pounds per acre. The contour wattles were mulched with marsh hay at the rate of 4 tons per acre. All other raw areas on this plot were likewise mulched and seeded, by a method similar to that used on plot 1. The contour wattles on the upper one-third of the plot area were planted to a mixture of gray dogwood, chokecherry, and coralberry. These were spaced 18 inches apart in rows on the contour benches. The remainder of the plot was planted to black locust.

To demonstrate the use of various types of mulching materials in establishing vegetation, plot 4 was divided into two parts. Corn stover at the rate of 3 tons per

acre was used on one, and chopped brush on the other. Both materials were fastened down by used woven wire and willow stakes. Contour wattles were built across the lower one-fourth of this plot because of numerous shallow gullies. They were built similarly to those on plot 3, except that willow stakes 12 inches apart were driven in the edge of the benches. After seeding, the wattles were mulched with marsh hay at the rate of 4 tons per acre. The upper third of the plot was planted to coralberry and American hazel; the middle part to red osier dogwood and arbor vitae; and the lower third to redbud and mountain ash.

When work was started on plot 5 it was barren of vegetation and the top half of the plot was vertical. Wave action had been more severe than on any other plot in the demonstration although frost action was less severe. Erosion was no doubt held in check by the growth of vegetation above the plot area, but inasmuch as no seepage was noted on the plot it is believed that the absence of this factor greatly reduced erosion from frost action. This plot, because of its barren and steep topography, made the problem of controlling erosion extremely difficult.

Because plot 5, as well as plot 6, was subject to wave action, a railroad tie cribbing was built across the toe of the slope on half of plot 5 and half of plot 6. The vertical faces of the upper parts of these plots were sloped back by blasting and hand labor to an average grade of 75 percent. This grading made fills which covered the lower halves of the plots behind the cribbing to a maximum depth of 6 feet.

On plot 5, five post and board dams were built across the plot on the contour, averaging about 12 feet apart. These dams were used in an attempt to hold the loose fill dirt in place and were constructed as living dams by placing used boards, willow brush, and marsh hay above willow posts. The entire area was seeded at the rate of 75 pounds per acre. Fine brush was used as mulch. The upper half of the plot was seeded to chokecherry and planted to coralberry, caragana and American hazel, and the lower half to caragana and black locust.

In an attempt to effect stabilization of the large amount of fill dirt in plot 6, contour wattles were used over the entire area. A trench approximately 8 inches deep was dug and the dirt taken from it was used to form a ridge along the lower side of the wattle. Then 24-inch willow stakes were driven 18 inches into the ground, 18 inches apart on the ridges. The trenches were packed with willow brush and cuttings and loose dirt. The maximum horizontal spacing between these contour wattles was 4 feet. The plot area was seeded at the rate of 75 pounds per acre and mulched with marsh hay at the rate of 4 tons per acre, except the southern quarter of the plot area, which was left as an unmulched check strip. This practice was supported by a pole-and-brush dam built across the base of half of the plot area. This living dam was constructed by placing willow poles 2 to 3 inches in diameter horizontally in front of willow posts.

The upper half of the plot was planted to buffaloberry, coralberry, caragana, Japanese barberry and chokecherry seed, and the lower half to black locust and caragana.

Protection against wave action is of utmost importance. The success of the stabilization work carried out on the face of the bluff depends directly on beach protection. A permanent mechanical revetment or cribbing would control wave action completely but the cost would be too great to be economical under average conditions, even though the element of chance does enter into a vegetative control program.

Briefly stated, the stabilization measures used for the control of wave action at the base of the plots are, (1) the planting of a tree and shrub belt 20 feet wide along the base of each plot, (2) the use of living dams at the base of plots 1 and 6 and (3) the combination of vegetative and mechanical control by the use of railroad tie cribbing at the base of plots 5 and 6.

In addition to these measures, a snow fence 4 feet high was set up 50 feet from the toe of the bluff, paralleling the entire length of the project. This fence was to serve a two-fold purpose: First to build a foredune; and second, to keep the public off the project. To speed up the development of a foredune and to fill this dune with a mass of soil-binding roots, an area 40 feet wide extending from the tree and shrub belt to approximately 7 feet beyond the snow fence was planted to American beachgrass in the fall of 1939. This beachgrass was planted in nets, one net consisting of a square $6\frac{1}{2}$ feet on a side. From 5 to 10 tufts were planted inside each square.

Of the various methods used in attempting to stabilize erosion on the clay bluffs, the most outstanding are these: First, the *use of mulching materials*, such as marsh hay with woven wire and willow stakes to hold it in place. To date this method has given the best stand of vegetation and the best control; 10 to 20 percent of the willow stakes have survived and made excellent growth. Corn stover and brush mulch have not worked so satisfactorily. Second, the *use of living dams*, such as the willow post, woven wire, and willow brush dam. Although the willow posts have not survived, the brush used behind these dams has made excellent growth and the dams are truly living barriers.

U. S. GOVERNMENT PRINTING OFFICE: 1942

For REFERENCE

Compiled by ETTA G. ROGERS, Publications Unit

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[1] Prepared solely for use by the Soil Conservation Service and official cooperators. Not available for general distribution.

[2] From Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

Land for More People in the Mississippi Delta

By JOHN G. SUTTON[1]

Recently while studying drainage conditions in northeast Arkansas I was impressed by the extent of cut-over land that is being cleared; by the large number of new settlers who have moved onto their farms; by new buildings, and by the rows of cotton and corn running in between the deadened trees and partially burned stumps. Not all of the land development is new—much of the land, particularly along the higher ridges, has been farmed for a long time. The older mainly traveled roads run along the ridges, and one must travel the back roads through the lower lands to appreciate the extent of recent land development. In this section of Arkansas are to be seen unusual contrasting pioneer and modern conditions: log cabins from native logs, surrounded by partially cleared (Continued inside on p. 203)

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